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QUARANTINE AND THE PLAGUE:

BEING A SUMMARY OF

THE REPORT ON THESE SUBJECTS

RECENTLY ADDRESSED

To the Royal Academy of Medicine in France;

WITH

INTRODUCTORY OBSERVATIONS,

EXTRACTS FROM PARLIAMENTARY CORRESPONDENCE,

AND NOTES.

BY GAVIN MILROY, M.D. &c.

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ADVERTISEMENT.

THE REPORT, contained in the following pages, appeared in the last Number of the MEDICO-CHIRURGICAL REVIEW. But as the subject of the Quarantine Laws will, in all probability, be brought before the notice of the Legislature in the course of the ensuing Session of Parliament, Dr. BOWRING having announced his intentions to that effect, it has occurred to me that the interesting and, on most occasions, very conclusive facts and reasonings adduced by the French Commission should be made as public as possible. To render them intelligible to all, and in the hope of disentangling the subject from many of the perplexities which have hitherto surrounded it, I have prefixed some introductory remarks on the proper meaning of such words as *Contagion*, *Infection*, *Endemic*, *Epidemic*, &c.

The Extracts from the Parliamentary Correspondence, printed in 1842 and in the course of the present year, will be found to contain much valuable information.

G. M.

30, FITZROY SQUARE,

October, 1846.

QUARANTINE AND THE PLAGUE,

§c. §c. §c.

It must surely be quite unnecessary to say a single word in the way of soliciting our readers' patient and most attentive consideration of the facts and reasonings, which we are about to bring under their notice. The subject of the Quarantine Laws is one of public and very urgent interest. All persons are more or less immediately concerned in their operation and effects ; for whatever interferes with the free and unrestrained intercourse of one nation with another, cannot fail to affect the common welfare. To the medical man the subject is, as a matter of course, doubly and trebly interesting ; some of the most curious and important questions, connected with the natural history of pestilential diseases, are involved in its right adjustment. It is to medical doctrines and to medical opinions that we owe the present system of prohibitory restrictions, which so seriously interfere with the social comforts and commercial success of numerous countries ; and therefore for this reason alone, if there was no other, it well becomes the members of our profession to be foremost in making a calm and candid examination of those doctrines and opinions from which such grave consequences have followed. Now, every one who has made himself acquainted with the subject, be he physician or merchant, traveller or statesman, has of late years, without exception, come to the decided conviction that it is high time for a thorough revision and a very material modification of the Quarantine laws, such as they now exist, to take place. The absurdly foolish and most ridiculous principles which they embody, the vexatious and oppressive restrictions which they impose, the wretchedness and suffering which they almost necessarily give rise to, and the great increase of mortality which, we have reason to believe, they often occasion, are surely sufficient grounds for the scrutinizing investigation that is so generally demanded. For some years past, the Governments of England and of France have been using their best exertions to effect a change, and have been trying to get the various Continental powers to co-operate with them in their good work.

It is the object of the following pages to explain what has been done in both countries. But before we can enter upon this task with advantage, it will be advisable—we should rather say, it is absolutely necessary—to determine with precision the meaning of certain terms and expressions which are continually recurring in the examination of the question before us, and the very vagueness and obscurity of which have mainly contributed to the senseless discussions and very pernicious disputes that have so long retarded its solution.

In the French Report, which we shall presently have to analyse with great minuteness, the word *transmissible* is substituted for the more usual ones *contagious* or *infectious*, to denote such diseases as are capable of being transmitted or communicated from one person to another. The substitution is, in our opinion, a wise and useful one ; as we shall now endeavour to shew by a few obvious and intelligible illustrations.

I. There are certain maladies which can only be transmitted or communicated, when either the diseased part in the sick person, or matter taken from it, is brought into immediate contact with the body of a person in health. To this order belong the Ringworm of the scalp, the Itch, Syphilis and Gonorrhœa, Cow-pox (in man at least), Hydrophobia or Rabies, &c. These maladies are incapable of contaminating the atmosphere ; and persons, for aught that we know to the contrary, might remain for days and weeks in the company of patients affected with any one of them without the risk of catching the disease, provided all contact, direct or indirect, be cautiously avoided. It is to this order of diseases that the term *contagious*, *i. e.* communicable by *contact*, should be strictly limited.

But there is a distinction between the members of this order that requires to be kept in mind. In some, the mere contact of the morbid matter with the external surface of the body of a person in health is sufficient to produce the disease in the latter. Such is the case with the Ringworm and the Itch. In others, the matter must be applied either to the skin deprived of its epidermis by abrasion or incision, or else (what is nearly equivalent to this) to a mucous surface. There is no reason to believe that the virus of Cow-pox or even Hydrophobia would affect a person, if there be no injury of the skin of the part to which the poisonous matter is applied ; in other words, unless it be *inoculated* ; and we well know that the syphilitic and gonorrhœal poisons are innocuous, except when brought into contact with a mucous surface.

The distinction now alluded to is not without its practical bearings, as we shall see when we come to consider the mode or modes in which the Plague is said to be propagated. To say that inoculation is nothing more than mere contact would be about as rational as to assert that the process of grafting consists simply in applying the branch of one tree to the trunk of another.

II. The second order of transmissible or communicable diseases contains those which are propagated by the atmosphere, around a patient, becoming infected or contaminated by a peculiar effluvium or miasm which emanates from his body, and which being inhaled into the lungs—and admitted, it may be, at the same time into the stomach—of a person in health, has the

property of inducing like symptoms in him. Here there is no palpable or substantial virus, as in the former case, that can be directly transferred from one individual to another, either by simple contact or yet by inoculation ; at all events, the effluvium or morbidic miasm is not appreciable by any of our senses. All that we know of it is from its effects ; for we find that, when an individual in health remains for some time in the immediate neighbourhood of a patient labouring under such a disease, he is liable to become affected with it, although there has been no contact with, nor even any close approximation to, the sick person. Moreover, there is every reason to believe that the disease would never be communicated by mere contact with the patient's body, if it could be so arranged that the person, on whom such an experiment was made, did not inhale the contaminated atmosphere.

Hooping-cough and Scarlatina are examples of this order of communicable or transmissible diseases. They propagate themselves by *infecting* the atmosphere : hence they are properly called *infectious*, in contradistinction to the former order which are termed *contagious*. In the French Report, the expression " miasmatic infection " is generally used to designate this mode of transmission.

Some writers indeed, men too of acknowledged ability, have objected to the distinction now made between contagious and infectious diseases, on the ground that infection (in the sense we have used it) is nothing more than a mere variety, kind, or peculiar mode of contagion. In both sets of diseases, they say, there is the application of a morbidic matter to the body of a person in health ; the only marked difference being that, in the one case, the poison is cognisable by our senses, and, by being applied to one point of the body, in general excites the disease primarily in that spot ; whereas, in the other case, it is diffused through the atmosphere and is imbibed into the system, over a much larger surface, by the lungs, and, it may be, also by the skin, and even by the stomach. In both cases, therefore, there is contact. Now we are not at all disposed to deny the logical accuracy of the objection ; and, were the question before us one of mere theoretical or technical interest, we might be inclined to admit its validity. But, when we come to look at it in a practical point of view, and more especially to consider it in reference to measures of prophylactic treatment, we shall at once perceive the importance of distinguishing such diseases as are *simply and only contagious*, from those which are *simply and only infectious*. It is surely unnecessary to adduce examples to prove the truth of this remark. Suffice it to say that no prudent mother would be satisfied with the same precautions to prevent the spreading of Hooping-cough in her family as with those she used to prevent the spreading of Ringworm ; and need we remind our readers how much cruel suffering, as well as vexatious annoyance and extortionate expence, might be annually spared, if the difference between infection and contagion were always recognised in the lazarettos for the Plague ?

The miseries that have been so long, and still are, inflicted on thousands from the almost universal and exclusive adoption of the notion that the plague is transmissible by contact alone, are only to be equalled by the ridiculously absurd puerilities of which it has been the prolific source.

Before quitting the subject of *infectious* diseases, we must call the reader's attention for a few moments to a circumstance connected with

them, which has hitherto been far too much overlooked by most writers on this important theme of medical enquiry. It is simply this. Whenever a number of human beings, even in a state of health, are cooped together in a narrow ill-ventilated space, the air gradually becomes so contaminated by the effluvia given off from their bodies that, in the course of a more or less limited space of time, Fever will almost inevitably make its appearance among them; and this fever, so generated, will often be found to exhibit infectious properties, if the sick are not removed to a more airy and wholesome locality. Something of this sort was observed in the case of most of the 23 survivors of that dreadful night, when upwards of 140 human beings were shut up in the Black Hole at Calcutta. We have daily illustrations of the same fact in what takes place on board troop and slave ships, in jails, crowded penitentiaries, and so forth.

If such then be the case with persons in health, can we wonder that the effluvia from the bodies of the sick must be still more poisonous and contaminating? If any one has a doubt upon this score, let him walk from the open air into the ward of a hospital, when all the windows have been closed for a time; a sense of nausea and oppression, accompanied not unfrequently with actual shivering, are often immediately experienced.

Now it is in the way we have just mentioned that various maladies, which are certainly not primarily or essentially infectious, are apt to become so in impure and badly-ventilated situations, more especially when many sick are crowded together. The infectiousness is not a necessary quality of the disease; it is an accessory or contingent attribute. Various forms of low or typhoid Fever, Erysipelas, Dysentery, Angina, &c. may be mentioned as affording not unfrequent examples of the phenomenon in question. The consideration of this subject teaches us two important lessons. In the first place, it inculcates the imperious necessity of thorough cleanliness and free ventilation, wherever a multitude of sick persons are congregated together; and in the second, it exposes the absurdity of the disputes which have so often taken place about the infectiousness or non-infectiousness of several diseases. We shall have more than one opportunity of reverting to this topic as we proceed.

What has been observed in the case of human beings, holds equally true in that of the lower animals. Disease is always liable to break out among cattle, when they are crowded together in close and filthy sheds or covers. Some of the best writers on veterinary medicine have asserted that the mere detention of many horses together—especially when these are of an inferior breed, and their food is of bad quality—in stables that are foul and offensive, or on board ships, is in itself sufficient to engender the Glanders; a disease which, when once developed, is not only exceedingly apt to spread to other horses, but is even liable to infect human beings.

III. We have seen that some diseases are transmissible only by direct contact with the sick or with a palpable virus or poisonous matter derived from them, and others only by the atmosphere becoming infected with effluvia given off either directly from the bodies of the sick, or, it may be, from articles of dress, &c. which have become deeply impregnated with such effluvia. Now there are certain diseases that are capable of transmission in both of these ways. Small-pox is, as every one knows, of this number; so is

Measles, according to the views of many physicians; so is Hospital Gangrene; and so is Glanders in the horse. We might add two or three more to the list; but they are of more questionable authenticity. Might not the appellation of *contagio-infectious* be given to this order of transmissible diseases? If any more appropriate epithet, that will better indicate the two-fold mode of transmission, be proposed, we shall gladly make use of it.

It deserves to be noticed that, in all *contagio-infectious* maladies that we are well acquainted with, the simple contact of the morbid matter with the uninjured cutaneous surface is not sufficient to communicate the disease; the matter must either be inoculated, or else be applied to a mucous surface, for its contagious effects to be produced.

These few remarks on the modes in which certain orders of diseases are transmissible from one person to another, we earnestly recommend to the reader's considerate attention; otherwise he might not be able to judge aright of some of the most important questions, connected with the propagation of the Plague, to be shortly brought under his notice. All that we shall say at the present moment respecting this hitherto ill-understood disease is, that it has been declared by one—and by far the most numerous—party to be *contagious*; by a second party, to be *infectious* but not *contagious*; and, by a third party, to be *contagio-infectious*. The solution of this question is the paramount object of our enquiries; but, before we proceed further, there are two or three other terms that require a brief explanation.

Those diseases are called Endemic (*εν in*, and *ἔθνος a people*), which are in a great measure limited to certain localities, and are attributable to peculiarities of soil and atmosphere, or of the food, habits, &c. of the people in these localities. Ague is endemic in Lincolnshire and other marshy countries; Remittent Fevers and Dysentery in all tropical regions, near swamps and rivers; the Plague is endemic in Egypt, and the Yellow Fever on the West Coast of Africa; Typhus in the filthy and crowded parts of all large cities; Bronchocele in Derbyshire, and Cretinism in some of the valleys of the Alps; Pellagra in Lombardy, and Elephantiasis in Barbadoes. We might adduce many other examples; but these are sufficient to give an idea of what is meant by the term endemic. “Indigenous,” and “of spontaneous growth or development,” occasionally used in the following pages, are equivalent expressions.

As endemic diseases are owing to the operation of more or less permanently existing local causes, it must be obvious that it is only by a patient being withdrawn, at a sufficiently early period, from the sphere of such operation that he can rationally hope to be cured. If he persist to remain in the offending locality, his malady will inevitably be aggravated. Change of residence, therefore, is the *sine quâ non* in the successful treatment of almost all endemic diseases. For the same reason, if the local causes themselves be gradually removed, this order of diseases ceases to be generated. Thus many districts, that used to be the seat of intermittent fevers, have been in course of time rendered quite healthy by efficient draining. Such has been the case about Lambeth and some parts of Westminster—the neighbourhood of the Marsh-gate, for example. In short, the prevalence and severity of endemic diseases are generally inversely proportionate to the

territorial improvement of a country, and to the increased civilization and social comforts of its inhabitants.

The term “Epidemic” (*ἐπι upon*, and *δῆμος a people*) is used to designate those diseases which prevail for a limited period, and generally at particular seasons, over a wide extent of country and often attack a large number of the inhabitants at the same time, then subsiding of their own accord until they entirely cease for the season. The causes of the appearance and disappearance of epidemics are little, if at all, understood. Some epidemics are of the endemic class of maladies, such as Typhus, Yellow Fever, and the Plague; others are not, but of more universal development, such as Small-pox, Measles, and the other Exanthemata. Their outbreak is often sudden and widely extended, spreading alarm and desolation around; they are then called *pestilences*. A pestilence may be transmissible; but it is not necessarily so. At all events, its diffusion is obviously not dependent upon such a slow and gradual process as infection or contagion. It does not creep from person to person in its onward course, but it seems to travel on the wings of the wind. Hence we read in Scripture of “the pestilence that walketh by noon-day and the arrow that flieth by night:”—how beautiful and how true; it walketh by the day, but it flieth by night; for its attacks are then always the most numerous and the most severe. Every one knows the fine description which Homer has given of the nine-days’ pestilence in the Grecian camp, when the arrows of the angry God (*γυκτί’ εοικώς* “gloomy as night”) spread havoc among man and beast.*

Not less expressive is the image employed by the noble poet in his famous lines on the destruction of the host of Sennacherib, when

“The angel of death spread his wings on the blast,
And breathed in the face of the foe as he passed.”

An old man in Persia said to Dr. Lacheze, who was questioning him about the plague, and its mode of diffusion, that it will often break out in spite of the most complete isolation; “for,” added he, “the disease may light upon a house as a bird lights upon the branch of a tree.” Most true; we know not whence the secret foe cometh; it is like the wind, it bloweth where it listeth.

The ancient physicians very properly confessed their ignorance of the cause of Epidemic diseases; they recognised a something mysterious—*το θεϊον, quid divinum*—in them which they could not fathom. All that we can say is that, in some years and seasons, the atmosphere appears to become charged with a noxious influence, causing or promoting the diffusion of certain diseases, which, in other years and in other seasons, are *sporadic*, *i. e.* sparse, scattered, or which only occur here and there. This occult

* The late dreadful invasion of epidemic Cholera at Kurrachee in Scinde appears not to have lasted more than ten or twelve days; within that short space of time, it swept off upwards of 8000 human beings! The disease broke out at night. Altogether, this invasion exhibited the characters of a pestilential visitation in as pure and marked a degree as any of which we ever read. After its murderous ten-days sojourn at Kurrachee, it is described as travelling up along the course of the Indus towards Hydrabad.

state of the atmosphere is technically called an “epidemic or pestilential constitution,” and the locality where it prevails is said to be an “epidemic or pestilential focus,” or a “focus of pestilential infection.” As these terms occur frequently in the following pages, it is necessary that their meaning be well understood.

Notwithstanding that Epidemic diseases are not, like Endemic, dependent for their origin upon local causes, it must be borne in mind that their malignancy, and perhaps their duration also, are almost invariably much influenced by the general salubrity of a place, and by the condition and habits of its inhabitants. The low-lying districts of a town or country suffer worse than the more airy and elevated; and we need scarcely add that the ill-fed poor, living in filth and wretchedness, are always the chief victims. It is under such unfavourable circumstances that all epidemic diseases, whether they be essentially and primarily infectious or not, invariably appear to be readily transmitted from one person to another. We shall afterwards see how difficult it is, on many occasions, to come to an accurate decision upon this point; but of one thing we are pretty well assured, from the concurring testimony of the best observers, that the transmission of a disease can do but little harm upon a great scale, unless aided not only by a pestilential condition of the air, but also by local causes of insalubrity. It is to the correction of the last-named adjuvants that the attention of statesmen and legislators should be mainly directed, under the sober guidance of enlightened physicians.

Epidemic diseases are not confined to the human race; they are exceedingly common among brutes, and are then called Epizoics or Epizootics (*ἐπὶ upon*, and *ζῶον an animal*); in common parlance, *murrains*. Epizoics often precede or accompany the existence of Epidemics among man.

The vegetable world also is not exempt from pestilential invasions, too well known as *blights*. The potatoe-disease, so widely spread and so destructive at the present time, is in all respects a Vegetable Epidemic. We need scarcely say that we are quite as ignorant of the cause of this as of most other like visitations. Is it of insectile origin? Many circumstances seem to render this idea not improbable.*

After these preliminary observations, we shall now proceed to notice very briefly some points in the literary history of the Plague during the last ten years or so, with the view of pointing out the changes of opinion that have taken place in the minds of many medical men and others on the important questions connected with its mode of propagation.

It is only since the year 1835, when Egypt was visited by one of the most fatal outbreaks of epidemic plague on record, that the real and intimate nature of the disease has been thoroughly known. Before that time, there was so much of mere conjecture and idle tradition mixed up with its history, that we cannot with any confidence build upon the accuracy of the

* Dr. Grassi, so long resident in Egypt and other Eastern countries, and who has had such ample experience of the Plague, maintains that this and indeed many other transmissible diseases, are of insect origin;—*é molto probabile che la cagione produttrice di una malattia contagiosa consista in una specifica sostanza organizzata, la quale sia capace di mantenersi et di riprodursi seconde le leggi comuni di tutti gli esseri dotati di vita.*

data that are found in the narrations of preceding writers. Most of them seem to have looked for corroboration of already adopted opinions in the cases which came under their notice, and not to have examined the actual phenomena of the cases themselves to teach them what opinions they should hold. Hence the comparative unprofitableness of most of the works on the Plague published before 1835. Then it was that the entire subject of its history was examined *de novo*, all the materials connected with it stirred up, so to speak, from the bottom, and subjected to a most sifting investigation, while nothing was assumed or taken for granted upon hearsay evidence or partial enquiry. The evidence that has been made public by that noble band of devoted Frenchmen, of whose labours we shall presently speak at large, and of our own countrymen, Drs. Laidlaw and Abbott, is infinitely more useful than the labours of all previous writers. But, not among medical men only have sounder views prevailed on the subject of the plague since 1835; the consular agents, ambassadors, and ministers of this country and of France have also largely partaken of the same advancing enlightenment. It is indeed most gratifying to read the official correspondence of public men in both countries upon this subject. While in Italy, within the last eight or ten years, bars of iron have been actually passed through the fire to destroy the contagion adhering to them, and vessels from Great Britain have been subjected to a quarantine at Messina in consequence of a report in a French newspaper that typhus fever existed in Glasgow; while a quarantine of 42 days has been instituted in more than one country against the invasion of East India Cholera, and a cargo of New Orleans cotton, that had been landed and re-shipped at Liverpool, has been declared at Copenhagen infected after another fortnight's voyage—while these and many such-like things have been acted over and over again in different European ports during the last few years, it is nevertheless equally true that men of education everywhere have begun to feel the urgent necessity of putting an end to such absurdities. The credit of taking the lead in this much needed reform is equally shared by France and this country.

In 1838, a proposal was made by the French to the British Government to promote the formation of a general Congress of Delegates from the various European states having ports in the Mediterranean, for the purpose of agreeing upon some uniform system of Quarantine regulations to be adopted by all. Our Government at once acceded to the proposal. Austria also, which had been applied to by France at the same time, intimated at first her assent to its general principles and substance, only with some modifications in the details. Difficulties, however, were subsequently started; and the result was, most unfortunately, that the matter dropped entirely for the next four or five years.

In the course of the same year (1838), and indeed anterior to the date of the proposal of the French Government, we find that Mr. Lewis, one of Her Majesty's commissioners for enquiring into the affairs of Malta, in a very able document respecting Quarantine regulations in the Mediterranean, after expressly asserting that "it is notorious that the mode or modes in which plague is communicated are very imperfectly known, and that some of the maxims, on which the most important Quarantine regulations rest, are little better than gratuitous hypotheses," suggested that two or

more medical men should be sent out by the British Government to visit all those ports of the Levant where the plague most frequently exists, with the view of collecting ample and authentic information upon the mode or modes in which it is propagated or liable to be communicated. He suggested at the same time that France and Austria should be invited to join with us in this enquiry.

When Mr. Lewis' views were submitted by Government to Sir William Pym, our Superintendent-general of Quarantine, for his opinion, he, with sound judgment, we think, proposed that, instead of sending out physicians from this country, "copies of Mr. Lewis's queries should be forwarded to the different consuls at Constantinople, Smyrna, Aleppo, Alexandria, Cairo, and Odessa, to which might be added Marseilles and Malta, requesting them to submit them to the different European physicians, and to obtain from them replies and observations, which might be forwarded to the Quarantine Congress expected to assemble in the course of the present year" (1839).

Sir William's suggestion was acted upon; and the following queries, modified somewhat from those originally proposed by Mr. Lewis, were drawn up for the occasion :

1. Is plague communicated by contagion ?
2. Is plague communicated by contagion alone, or by other means also ; and, if so, by what means ?
3. Is actual contact with an infected person necessary for communicating plague, or will a close approach to such person communicate the disease ?
4. Can substances which have been in contact with an infected person communicate the plague, and, if so, what substances ?
5. How long may the infection of plague remain dormant in an infected person, before it declares itself by evident symptoms ?
6. How long will the contagious matter of plague, when lodged in inanimate substances, retain its infecting power ?
7. What are the means by which substances, containing the contagious matter of plague, may be purified ?

The replies furnished to these queries by different medical men in Egypt and elsewhere, more especially those of Clot-Bey, Dr. Laidlaw, and Dr. Grassi, are replete with the most valuable information. Frequent reference will be made to them in the following pages.

Here we must not omit to draw notice to a brief dispatch addressed by Lord Palmerston in February 1839 (before the above replies were received) to Lord Ponsonby, our Ambassador at Constantinople, on certain harsh quarantine measures about to be enacted in Turkey; it is full of the soundest medical wisdom :—

"With reference to the proposed regulations, I have to instruct your Excellency to endeavour strongly to impress upon the Turkish Government that they would more effectually prevent the breaking out and spreading of the plague, by introducing cleanliness and ventilation in the city and suburbs of Constantinople, than by any such violent interference as is proposed with the domestic arrangements of families.

"It is quite certain that the plague is much aggravated, if it is not actually generated, by the want of cleanliness in streets, by the want of sufficient ventila-

tion in houses, and by the want of proper drainage in places contiguous to habitations; and, if the Turkish government would, in the first instance, apply vigorous measures to correct these evils, they would strike at once at the causes of the disease; whereas the measures, which they have now in contemplation, will only be productive of inconvenience and suffering to numerous individuals."

In 1841, Dr. Robertson, deputy-inspector of hospitals and serving with the British troops in Syria, thus expresses himself in his official report to Government on the Plague :—

"In reference to the contagious or non-contagious* nature of this at times frightful disease, I beg to state that the result of all my experience leads me to believe that the disease originates in local causes, and that it is endemic in Syria and Egypt; that it is not of a highly contagious nature; and that, if ever so at all, some other concurrent circumstances are necessary to render it so. Extreme and exclusive opinions on the doctrine of contagion are hardly warranted by the present state of our knowledge. My own firm conviction is that the plague cannot be communicated from one person to another in a pure atmosphere, even by contact; but I am not prepared to assert that, if plague-patients are crowded together in confined and ill-ventilated apartments, infection will not be produced, just as happens in Typhus fever."

Mr. Brant, our consul at Erzeroum, writing about the same period respecting the then recent severe outbreak of the plague there, says :—

"As far as my own experience goes, I have been led to doubt the contagious nature of the disease, as it showed itself here last Summer; or, if it were contagious, it must have been in a very slight degree. I have had, within the sphere of my observation, many cases of the most complete and extensive contact, without the disease being communicated."

Mr. Sandison also, our consul at Brussa, informs us that "the cases are numerous in which persons escape the disease after contact with persons seized with it, even in its most malignant stage. There are frequent instances also of individuals being attacked by the plague, without being at all able to trace communication with any infected person or substance."

Influenced no doubt by these and other similar statements, Lord Aberdeen, following in the same path of enlightened policy with his predecessor, endeavoured in 1843 to bring about the establishment of the proposed general Congress which, to the great regret of every humane and liberally-minded statesman in Europe, had never yet taken place. The French Government readily acquiesced in his views; but the Austrian, while professing their readiness to co-operate, considered that the holding of any conference or congress would be premature, until exact information was procured from competent medical men upon the following three points :—

1. The minimum and maximum of the terms of quarantine to be fixed upon for persons.
2. The terms of quarantine necessary for goods and merchandize.
3. The best measures to be adopted for the disinfection of objects that are susceptible of contagion.

* These words are used here in the sense of "transmissible" and "non-transmissible."—G. M.

To recognise the settlement of these points to be a necessary preliminary to any satisfactory adjustment of the question of Quarantine, is obviously to take for granted that the disease, to which they refer, is one that is transmissible not only by persons, but also by goods, under all circumstances and at all times ; a position that few unprejudiced men in the present day are likely to maintain. As a matter of course, the British and French governments, unable to act independently, were obliged to give in to the lagging policy of the Empire ; Prince Metternich having intimated that six months at least would be required to obtain the information which he deemed necessary. But neither France nor England has meanwhile been idle in the good cause of Quarantine reform, resolved that all just or alleged causes of delay should be removed as promptly as possible. The former summoned her enlightened Institute to her aid, and the latter dispatched Sir William Pym to visit all the lazarettos and quarantine establishments in the Mediterranean. It is to the important information derived from these two quarters that we now solicit our reader's most serious attention.

In August 1844, the Royal Academy of Medicine in France appointed a Commission to examine all the varied questions connected with the Plague and with Quarantines. This Commission was composed of the following members—men, we may remark, of the highest professional and scientific attainments—MM. Adelon, Begin, Dubois (d'Amiens), Dupuy, Ferrus, Londe, Melier, Pariset, Poiseuille, Prus, and Royer-Collard. M. Ferrus was named the president, and M. Prus the secretary and reporter. The Commissioners were engaged in their deliberations for upwards of twelve months, and had every facility granted them by the French government, to render their enquiry as complete and as accurate as possible. At length, the report was drawn up and read at the sittings of the Academy, on the 5th, 10th, 17th, and 24th of March and the 5th of May of the present year. It is certainly a very elaborate and instructive work, replete with most valuable facts and data, which cannot fail to be truly acceptable to every enquirer upon the great questions under consideration, whether he admits the soundness of the conclusions adopted by the majority of the Commission or not.

Although the Plague has so often ravaged the world and there has been no lack, as a matter of course, of books and memoirs published at different times upon the subject, it must be confessed that the number of instructive and really accurate narratives of well-observed *facts* is by no means very considerable. The epidemics, of which we have the most trustworthy histories, are the following:—that of Nimeguen in 1635, described by Diemerbroek ; that of London in 1665, described by Sydenham and Hodges ; that of Marseilles in 1720, by Chicoyneau, Verney, Deidier and Bertrand ; that of Transylvania in 1755, by Chenot ; that of Moscow in 1771, by Mertens, Orroëus, and Samoilowitz ; and those of Egypt in 1798, 1799 and 1800, which have been so well described in the writings of Desgenettes, Larrey, Pugnet, and Louis Frank.

But, however valuable the records of the epidemics now mentioned may be, it must be admitted by all who have attentively studied the history of the plague, that it is only within the last ten or twelve years (as

already remarked) that we have anything like a positive and truly scientific acquaintance with the disease.

Dr. Aubert-Roche was the first to display that brave and generous devotion to humanity and science, which has since been followed by so many of his professional brethren, when he devoted himself to wait for thirty-six hours unceasingly, and without taking any precaution, upon his friend Dr. Fourcade, who died of the plague at Cairo on the 20th of February, 1835.

Shortly afterwards, numerous plague patients were received into the hospital of Esbekiè, at Cairo. Clot-Bey, anxious to give the most complete authenticity to the observations which might be made of these cases, proposed to MM. Gaetani, Lacheze, and Bulard to join with him in forming a committee or board for the purpose of attending together upon all the patients in the successive stages of the disease, and of making *post-mortem* examinations. These four gentlemen carried through this task with the greatest zeal and devotedness. The infected were waited upon like other patients; they were freely touched whenever there was occasion to do anything for their relief, or for the investigation of their symptoms. The bodies of those who died were taken to the dissecting amphitheatre, and every organ was most attentively inspected. The results of each visit in common were carefully reported in a register, and each report was regularly signed by all four. This register (which was submitted to the perusal of the government Commission) is the chief basis of the works, which have been published by Clot-Bey* and Bulard.

Subsequently to these researches, the professors of the medical school at Abouzabel (about four leagues from Cairo) personally attended upon 140 plague-patients, of whom 38 died. Professor Perron has communicated a report of the observations and *post-mortem* examinations then made, in a memoir which he addressed to the Academy.

Drs. Aubert-Roche and Rigaud, attached to the great hospital at Alexandria, displayed no less courage and disinterestedness in their enquiries. The latter gentleman died of the plague, leaving behind him an account of 68 dissections which he had made of fatal cases.† The former has published an account of his observations, collected either by himself or in conjunction with his lamented colleague.‡

The conduct of M. Lesseps, the French consul-general at Alexandria, has been the theme of universal admiration. By his own example, he powerfully contributed to dissipate the exaggerated apprehensions of visiting and even

* This indefatigable person has sent no fewer than 50 memoirs, at different times, on the subject of the plague to the French Academy. Many of these memoirs, written by able men who have had ample opportunities of studying the disease, well deserve to be published.

† In the very valuable pamphlet on Oriental Plague and Quarantines, published by Dr. Bowring in 1838, it is stated that Dr. Rigaud, after having been, during the most fearful crisis of the pestilence (1835), constantly engaged in visiting and assisting the living or in dissecting the dead, at length fell a sacrifice "just as the plague was ceasing, when its violence appeared wholly exhausted, and the season of its disappearance was about to arrive."

‡ De la peste et du typhus d'Orient. Paris 1840.

touching plague-patients. His conduct towards Dr. Rigaud, up to the last moment of his friend's life, was a memorable instance of noble generosity.*

Since 1835, the medical men resident in Egypt have continued their efforts to render our knowledge of the plague more and more complete. In 1837, an epidemic broke out at Adana, in the corps of the Egyptian army that then occupied Syria. In 1841, Damietta, Cairo, and a number of the towns or villages in the Delta were visited by the pestilence. It is also to be remembered that not a year has passed since the great epidemic of 1835, without a greater or less number of sporadic cases occurring every now and then in different parts of Lower Egypt.

But the plague has been studied of recent years in other countries besides Egypt. To confine our notice to modern works only, we may mention Dr. Brayer's *Neuf années à Constantinople*; Dr. Gosse's account of the plague in Greece during 1828 and 1829; and the reports of Dr. Morea on the plague of Noja in 1817, and of M. Hemso on that of Morocco in 1818.

M. de Segur du Peyron, although not a physician, has rendered great services to medicine by the publication of the three reports which he addressed, in the years 1834, 1839, and 1846, to the Minister of Commerce, and which contain a great mass of observations collected by him in the principal ports of the Mediterranean.

Lastly, the Academy has received a *mémoire* on the plague and quarantine, published in 1845 by Dr. Moulon, physician of the lazaretto at Trieste; and also a printed report on the transmission of the plague and the yellow-fever, that was drawn up by a committee of the medical society of Marseilles, and unanimously approved of and adopted in August 1845.

Besides the published works above enumerated, a number of very valuable manuscript documents have been submitted to the examination of the Commissioners.

Among these, we may mention the original papers respecting all the cases of plague that have occurred in the lazaretto of Marseilles since 1720, along with a letter and memoir from Dr. Robert, one of the physicians of this lazaretto;—the register kept in Egypt and Syria, during the years 1828, 1829 and 1830, by the plague commission, of which M. Pariset was the president;—the report, addressed in 1842 to the minister of commerce, by Dr. Delaporte of his mission to Constantinople, Smyrna, and Alexandria, for the purpose of studying the plague in these places;—a statistical statement of 506 epidemics of the plague drawn up by Dr. Rossi of Cairo, who, like Dr. Delaporte, nearly fell a sacrifice to an attack of the pestilence;—the statistic report of all the cases of plague observed in the lazaretto of Alexandria since 1835, by Dr. Grassi, who has been physician of that establishment since 1831;—a memoir on the plague in Persia by Dr. Lacheze;—one on the plague in Algeria, from the year 1552 down to 1819, by M. Berbrugger, corresponding member of the Institute, and conservator of the library and museum of Algiers;—a memoir on the contagiousness of the

* Equally praiseworthy has been the conduct of Mr. Thurburn, the British Consul at Alexandria. His letter to the Board of Health in that city in 1838 is an admirable performance, characterised not less by generous humanity than by the bold enunciation of enlightened views.—G. M.

plague by MM. Pezzoni, Leval, and Marchand, members of the council of health of the Ottoman empire, dated June 1842 ;—and lastly, a memoir on the antiquity and endemicity of the plague in the East, and especially in Egypt, by Dr. Daremberg, the learned librarian of the French Academy.

In addition to these numerous sources of information, the Minister of Foreign Affairs granted to M. Prus the privilege of consulting the dispatches of the French ambassadors and consuls in the Levant on all topics connected with his enquiries. The dispatches of M. Lesseps, (to whom we have already alluded,) during the frightful epidemic of 1835 in Egypt, were found to be especially valuable. The Minister of Marine also put all the official documents under his control at the free disposal of the Commissioners.

With the view of rendering their enquiry as complete and comprehensive as possible, the Commissioners invited to their meetings the attendance of medical men and others, who might feel inclined to give any verbal communication. In this way, they received much valuable and interesting matter.

The Report is divided into four parts or sections.

In the *first*, the following points are examined and determined :—the countries where the plague has been observed to become spontaneously developed ;—the causes of spontaneous plague ;—the disappearance of the plague, whenever these causes have ceased to exist ;—the countries where the persistence of these causes renders the plague endemic, or at least makes the return of the spontaneous disease to be apprehended—and, lastly, the measures that are really and truly prophylactic against spontaneous plague.

In the *second* part, the three following questions are answered :—1. Has the plague always exhibited the characteristic features of epidemic diseases, whenever it has raged in Africa, Asia, and Europe ? 2. What are the distinctive characters between epidemic and sporadic plague ? 3. Does the plague spread after the manner of epidemic diseases ; *i. e.* by the migration of certain atmospheric influences, and independently of the agency of those persons who are infected by it ?

In the *third* part, the important question as to the transmissibility of the plague from one individual to another is examined. Is the disease transmissible by inoculation ? Is it transmissible away from, as well as in, epidemic *foci* by immediate contact with the sick ? by the contact of clothes, furniture, or merchandize ? or by miasms exhaled from the bodies of the sick, and diffused through the atmosphere ? This part closes with an examination of the following three questions. 1. Can persons affected with sporadic plague occasion *foci* of infection sufficiently active for the transmission of the disease ? 2. Is the plague more or less readily transmissible, in proportion to the intensity of the epidemic ; according as the disease is in its first, its second, or its third period ; and, lastly, according to the organic susceptibilities of those who are exposed to the action of the pestilential miasm ? 3. If the plague be transmissible away from epidemic *foci*, are there any grounds to apprehend that the importation of a few cases into France might occasion a pestilential epidemic ?

In the *fourth* and last part, the question as to the ordinary or exceptional duration of the incubation of the plague is discussed. The general conclusions of the Report, and the application of these conclusions to the important subject of Quarantine are appended to this part.

FIRST PART.

CHAP. I.—*What is the country, or what are the countries, where the Plague has been observed to arise spontaneously?*

In attempting to trace back the history of the plague, with the view of throwing some light upon this question, it would be little profitable to carry our researches beyond the sixth century of the Christian æra, as there is too good reason to believe that the terms *λοιμος* and *pestis* were previously used in a generic sense, to denote all epidemic diseases which caused great mortality. The “boils breaking forth with blains upon man and beast,” recorded by Moses, need scarcely be alluded to. The famous plague of Athens, so graphically described by Thucydides, is supposed by the best authorities to have been a malignant form of typhus, complicated with a peculiar eruption and with gangrenous eschars. The Greek historian says that it was believed in his day that the pestilence had been imported from Egypt into the Piræus.

Whether we are to admit the genuineness of the passage from Rufus of Ephesus, a celebrated physician in the time of Trajan—discovered by Cardinal Angelo Mai at Rome, in 1831, in the writings of Oribasius, who lived in the time of the Emperor Julian—is doubted by some learned enquirers; by M. Pariset, the accomplished secretary of the Academy, among the number. The passage indeed contains a remarkably accurate description of the characteristic symptoms of the plague,* and the writer refers to epidemics of the disease in Egypt, Syria, and Libya, mentioned by Dioscorides, Posidonius, and Dionysius, who (are supposed to have) lived two or three centuries before the Christian æra. It may be worthy of notice here that the writings of Cicero, Strabo, and Pliny afford evidence that Egypt was regarded, in their time, as a country that was fertile in the plague. There are allusions too in the works of Galen and Aretæus, not to mention Hippocrates, that would seem to indicate their acquaintance with malignant fevers accompanied with bubos and carbuncles.

But, without dwelling longer on the uncertain history of the plague, we shall at once come down to the year 542 of the Christian æra, when that terrible epidemic, the description of which by Procopius and Evagrius can leave no doubt as to the true nature of the disease, ravaged the city of Constantinople. From this period, the appellation has been very generally restricted to that form of fever which is accompanied with bubos,

* The following is one of several paragraphs that might be quoted:—

“A pestilential carbuncle is that which is accompanied with a severe inflammation, with acute pain, and delirium. In many of those who are affected with it, there occur also hard and painful bubos, and the patients soon die of these carbuncles. This is the case more especially with those who live in the neighbourhood of marshes.”

earbuncles, and peteehia. If we are to believe that from the 6th to the 16th century the term "plague" has been properly applied, we are surely justified in assuming that, from the beginning of the 16th century—that is to say, subsequently to the establishment of lazarettos in Europe—this word has only been employed in its right acceptance.

In the 16th century, there was (as far as we know) but one epidemic of plague in Egypt, and we find no mention of any in Turkey in Asia, or in Syria; whereas, in the course of this century, there were no fewer than fourteen invasions of the pestilence in France, twelve in Germany, eleven in Italy, nine in Dalmatia, six in Turkey (in Europe), five in England, five in Spain, two in Portugal, two in Poland, two in Belgium, and one in Switzerland.

In the 17th century, we have the account of but two invasions in Egypt, and of not one in Turkey (in Asia) or in Syria; whereas there were nineteen in Germany, eleven in Italy, eleven in France, six in England, five in Russia, four in Turkey (in Europe), three in Spain, two in Holland, two in Switzerland, two in Denmark, one in Sweden and one in Poland.

It seems, therefore, impossible that any one, who will take the trouble of comparing these figures (always supposing that they can be depended upon—G. M.) should not be struck with this remarkable circumstance; to wit, that the plague has repeatedly and most destructively made its appearance in many points or localities in the world, more especially in Europe, at various epochs when either it did not exist, or was only very rare, in Egypt. If such has been the case, we are surely bound to admit that the disease has often arisen spontaneously in other countries, besides Egypt, Turkey, and Syria. This is the view which M. Littré has taken; for he observes (article *Peste* in the *Dictionnaire de Médecine*) that "the plague was very frequent in Europe during the 16th and 17th centuries. Italy, France, England, Holland and Germany were attacked by this pestilence; and Paris and London witnessed it spring up in the midst of them just as Cairo and Constantinople now do."

In the 18th century, epidemic plague occurred nineteen times in Egypt, seven times in Turkey in Europe, four times in Dalmatia, four times in Germany, three in Russia, three in Spain, twice in Poland, twice in Greece, once in Italy, once in Sweden, and once in France, viz. when Provence and Marseilles suffered so severely in the years 1720 and 1721.

In the course of the present century, the epidemic plague has broken out eight times in Egypt, six times in Turkey in Europe, three in Greece, twice in Syria, twice in Italy, twice in Russia, once in Turkey in Asia, once in Germany, once in Dalmatia, and once in Morocco.

The statistical data which we have given, more especially those which have reference to the 16th and 17th centuries, appear to prove most incontrovertibly that the plague has arisen spontaneously, at certain periods, in very many of the countries of Europe and Asia. Our convictions upon this point will be much strengthened, if they are found to be supported by facts observed in our own day.

Dr. Laecheze, in the account of his recent travels through Persia, informs us that the plague has been repeatedly observed to arise spontaneously in several of the cities of Asia Minor, and particularly at Erzeroum, situated near the northern source of the Euphrates and about five days' journey from

Trebisond; a statement which has been amply confirmed by the report of the Turkish council of health, that was established in the year 1838. The same remark may be made respecting Aleppo.

There are numerous facts also that seem to prove that the plague is apt to appear spontaneously upon the banks of the Danube, as it does on those of the Nile and the Euphrates.

The Russian army in 1828, while engaged in war with the Turks in Moldavia, Wallachia and Bulgaria, was attacked with a very malignant fever that was accompanied with bubos in the groins and axillæ. Dr. Witt, principal physician of this army, while he has acknowledged that the fever resembled in every respect the true plague, gave it, however, as his opinion that it must be distinguished from this disease, because it arose on the banks of the Danube, independently of any importation from abroad! Dr. Sehlegel, who had been sent by the Russian government, before the arrival of Dr. Witt in Wallachia, to determine the nature of the epidemic, admitted that, although it shewed great affinity to the plague, it differed from the latter in being attributable in that country to putrid emanations containing mephitic gas! On the other hand, Professor Seidlitz of Petersburg did not hesitate to regard the fever as genuine oriental plague.* If it was really so—and surely there is no good reason to think otherwise—we have the authority of both Dr. Witt and Dr. Sehlegel that the disease was truly endemic and of spontaneous origin in the localities where it prevailed.

Although the plague may therefore arise spontaneously in a number of different localities, it is no doubt true that, in recent times, Egypt, Syria, and Constantinople—more especially the first—have been the principal *foci* of the disease. It is right here to mention that, since the year 1839, it appears that there has been no case of plague observed in Constantinople. The board of health of that city attributes this exemption altogether to the quarantine measures, that have been adopted of late years. May such be the truth! but let it not be forgotten that, before the terrible epidemic of 1812, not one case of the disease had occurred in that immense city for eight years;—a fact that is proved by the registers of the French embassy at the Sublime Porte.

Syria also appears, according to the testimony of Mr. Lander the English Consul at the Dardanelles, and of M. Beclard the French Consul at Smyrna, to have been completely exempt from the plague since the same period (1839). Dr. Lasperanza, attached to the Constantinople board of health, informs us that, in consequence of various sanitary improvements that have of late years been introduced, the disease has ceased to be endemic in Jaffa, as well as in other parts of Syria. In the present day, it is almost exclusively from Egypt that the importation of the plague may be apprehended.

* This gentleman has shewn that, whenever in times past the Russians have carried on war against the Turks on the banks of the Danube and on the coast of the Black Sea, their armies have almost invariably suffered from the plague. In consequence of this fact, and other considerations to be afterwards mentioned, he does not hesitate to affirm that, in these cases, the plague is to be viewed as only the worst form of the endemic fever of the country.

The general *conclusion* from all that has now been stated is that—

“ The plague has been observed to arise spontaneously, not only in Egypt, Syria, and Turkey, but also in many other countries of Africa, Asia and Europe.”

CHAP. II.—*In countries where the spontaneous plague has been observed, can the development of the disease be reasonably attributed to any determinate hygienic conditions?*

To solve this question, the Commissioners examined with great care the history of the various localities in which the plague has arisen spontaneously, within the last fifty years. And first with respect to Egypt. Now the most competent observers assure us that there is nothing in the mere climate of this rich, and, in many respects, highly-favoured country that will account for the generation of the pestilence; indeed, travellers have written in the most glowing terms of its beauty and salubrity. The year in Egypt may be divided into three periods or seasons. The *first* commences in August and ends with October; it is the period of the inundation of the Nile. The *second* comprises the next six months, from November to April; it is the season of the winter harvests, the ground being covered with trefoil, wheat, barley, flax, &c. The *third* begins in May, and terminates in August or September; it is the time for the cultivation of cotton, indigo, and rice. As we have already said, the natural climate of Egypt is on the whole a very salubrious one. Its drawbacks are but few; the chief being the coolness and humidity of the nights, the frequent and rapid variations of temperature in the day, the rains and fogs of the Delta during the winter months, the great heat and excessive dust in summer, and, lastly, the singular effects of the South wind, the *Kamsin*, upon the living body. Whence then comes the pestiferous atmosphere of some parts of this land? The answer is ready; man himself has given it birth; the inhabitant of the Delta, says M. Hamont* who long resided in Egypt, has prepared the causes of his own destruction. The destitution, filth, and misery of the poor inhabitants are extreme. Their wretched hovels are so horribly disgusting as almost to defy description; they are not only surrounded by, but are actually receptacles of, heaps of ordure and putrid matters. Not unfrequently the dead are buried immediately under the mud floors of these dwellings of the living; and many of the graves in the cemeteries (which are always within the villages), being left open, are continually exhaling a stench that is utterly intolerable to any stranger. Then, again, the food of the Fellah is always of the worst description, and often too of the most scanty supply. Rotten cheese, decayed vegetables, semi-putrid flesh or fish; such are the articles that he lives upon. The very water that he drinks is filthy and impure. And then think of his mental and moral condition; the brutish degradation of all his faculties and affections, his hopeless servitude, his blank unmitigated wretchedness.

The hygienic state of the cities and larger towns in Egypt is not much better than that of the villages. Cairo, with its 200,000 inhabitants, is a very hot-bed of the most disgusting and pestiferous impurities. From the canal,

* *Destruction de la peste et des quarantaines.* (*Bulletin de l'Academie Royale de Medecine*,—Paris, 1844, t. x. p. 40.)

which traverses it, there is constantly steaming forth a cloud of intolerable offensiveness ; and yet this is the supply of water for the use of its people ! There are no fewer than 35 cemeteries, of which 25 are within its walls. In the Copt quarter of the town, the dead are buried under the floors of the houses ; and nothing but a few boards separate the living from the putrid bodies of the deceased. From 80 to 90 corpses have been known to be huddled together in these horrible *sub-domal* receptacles. Can we therefore wonder that Cairo should be a generating focus of pestilential disease ?

That the circumstances now mentioned must tend to promote the development, and aggravate the intensity, of the plague will be disputed by none ; but then the question comes to be, are they sufficient to produce or originate it ? This thing is certain, that the disease has never been known to appear spontaneously in Egypt, except in places and seasons when these most pernicious agencies were at work.

The plague does not arise in Upper Egypt, Nubia, and Abyssinia ; nor does it ever extend above the first cataract of the Nile. The good quality of the soil, the ready efflux of the waters, the small number of the inhabitants, and the strong currents and agitations of the atmosphere appear entirely to counteract the morbid influence of the mode of life followed by the inhabitants.*

We are informed by Gaetani Bey†—first physician to Mehemet Ali, and who has resided in Egypt for the last 25 years—that the plague never extends beyond Assuan, in consequence of the difference in the situation, heat, dryness, and nature of the soil ; whereas it readily finds its way into the localities where there is much stagnant water. It is for this reason that Bagdad and Bussorah are in the present day subject to invasions of the pestilence, from which they were formerly exempt when effective police regulations were in force in these towns.

The seasons exert a no less marked influence on the development of the plague. The dry heat of what is called in Egypt the second summer, the prevalence of the northerly wind that usually sets in about the summer solstice, and the first dews that commence about this time, change alike the condition of the atmosphere and the organic aptitudes or susceptibilities : the pestilence ceases.

What has been now said respecting the artificial insalubrity of Egypt, arising from man's own negligence and vice, is nearly quite as applicable to Constantinople as it is to Cairo. The filth of some of its environs is altogether intolerable and disgusting. It is usually in the month of July, when the north or tramontane wind ceases and is succeeded by a southerly sirocco, that the pestilence makes its first appearance. As a matter of course, the putrefaction of all organic matters goes on much more actively at that season, in consequence of the high heat on the one hand, and the moist relaxing influence of the wind on the other. The localities, that are first attacked, are those which are chiefly occupied by the poor Greeks and Jews : hence the village of San Dimitri is usually the place where the earliest cases are observed.

* Pariset, *Causes de la peste*.—Paris, 1837.

† *Sulla peste che afflisse l'Egitto, l'anno 1835. Napoli 1841.*

We need scarcely say that, if Constantinople be bad, Erzeroum is much worse, in everything that respects hygienic salubrity. Fortunately the frequent severity of the winter season there, as well as the high winds that prevail in Armenia, tend much to attenuate the existing causes of the plague.

If from the Euphrates we pass to the Danube, we shall find the same causes of endemic insalubrity prevailing in those localities, where the pestilence has been known to arise. The poorer classes in Moldavia and Wallachia live in the greatest misery and filth. After the heats of summer, almost all the prevailing diseases assume a character of marked gravity. Malignant intermittent fevers are always more or less prevalent in autumn; these generally precede the appearance of the plague, which in these countries is usually only sporadic. Professor Seidlitz has endeavoured, as we have already seen, to establish the intimate connection between these two forms of febrile disease.

Dr. Mirolanof, who treated the plague at Achial in 1828, says that "the soldiers and officers, who had the intermittent fever, were affected with bubos and carbuncles. In the month of September the plague shewed itself especially in those who were convalescent from agues, and assumed the form of a tertian fever. The bubos appeared after the first or second paroxysm."

Dr. Rinx, who was at Adrianople during the whole course of the epidemic, remarks of the third degree of the epidemic that "the least severe degree of the plague so much resembled an intermittent fever that it was scarcely possible to distinguish the one from the other, before the appearance of the bubos."

From all these various facts, it is abundantly obvious that the hygienic condition of the four distinct localities, in which the plague has of recent years broke out spontaneously, is very nearly the same. It is a circumstance, too, of no trifling import that, wherever the producing causes of the disease are most abundant and concentrated, there it is always most severe and most readily propagable. The form most dreaded is that which appears in Egypt; next comes that of Constantinople, and after this that of Erzeroum; while that of the Danube, which has hitherto been generally regarded as of Constantinople growth, has not yet been sufficiently studied to enable us to decide respecting its relative severity.

Is it not also a remarkable fact that the four geographical points or localities, now mentioned, are all subject to malignant intermittent and other fevers? Are we to believe, with MM. Begin and Boudin, that the plague belongs to the family of marsh fevers? There are many circumstances certainly which seem to militate in favour of this opinion. Without dwelling on the geographical condition of Syria and other plague countries in the present day, we well know how prevalent intermittent fevers were in London during the 17th century, when that city was occasionally visited by the oriental pestilence. The readers of Sydenham are well acquainted with this fact.

The outbreak of the plague has not unfrequently followed upon wars, famines, and other wasting calamities; and, on the other hand, its ravages have invariably been observed to become less frequent and less desolating in proportion as the condition of the inhabitants of the affected countries,

in point of civilization and comfort, has improved. The researches of MM. Papon* and Aubert-Rochet† have satisfactorily proved the truth of this.

The general *conclusion* to which we arrive is that,

“ In all countries where the spontaneous plague has been observed, its development may be reasonably attributed to certain determinate conditions acting upon a large portion of the inhabitants. The principal of these conditions are, residence upon marshy alluvial soils near the Mediterranean or near certain rivers, as the Nile, Euphrates, and Danube; the dwellings being low, crowded, and badly ventilated; a warm moist atmosphere; the action of putrescent animal and vegetable matters, unwholesome and insufficient food; and great physical and moral wretchedness.”

CHAP. III.—*If the preceding statements be correct, the plague must be endemic in Lower Egypt, where all the conditions of insalubrity which we have pointed out are constantly present: Is such the case?*

All the most accurate and enlightened observers agree in answering this question in the affirmative. Not a year passes without the plague shewing itself at Alexandria in a *sporadic* form; generally between the months of November and the following June. This fact cannot be disputed; it is incontrovertibly proved by the reports of the Council of health that was established in that city 12 years ago. The same thing holds true with respect to Cairo, and other places in Lower Egypt; the testimony of Gaetani-Bey is unqualified upon this point. The *epidemic* plague, that which has so fearfully mowed down the Egyptian population, is happily more rare; although incomparably more frequent than in any other country of the world.‡ The number of epidemic invasions of the pestilence in Egypt from the year 1695 to 1834, have been (according to one statement drawn up by an Arab cheik) 19 in all. The mortality caused by some of the invasions has been truly frightful. If we take account of those only which have been very destructive of life, we find that Egypt has been visited with the scourge about once in every ten years.

Conclusion.—“ All the producing causes of the plague being found united in Lower Egypt, the disease is endemic in that country, where it is seen every year in the *sporadic*, and about every tenth year in the *epidemic*, form.”

The object of the next Chapter, the IVth, is to shew that Egypt was exempt from pestilential epidemics in ancient times, and until about the commencement of the seventh century of the Christian æra. Certain it is, that we have no very authentic account of any wide-spread and destructive invasion of the plague at an earlier period. The cases, alluded to by Rufus, appear to have been only *sporadic*; at all events, this writer makes no

* *De la peste et des epoques memorables de ce fleau.* Paris, an. viii. 2 vol. 8vo.

† *De la prophylaxie de la peste,* Paris, 1843.

‡ According to the calculations of M. Hamont, the population of Egypt, which was once, it is believed, upwards of ten millions, and was fully three millions at the commencement of the present century, does not now exceed a million and a half.

distinct mention of any epidemic pestilence having ever prevailed in Egypt, as he does of one that ravaged Libya upwards of 300 years before the birth of Christ.

That Egypt was once a remarkably healthy country is expressly attested by Herodotus. The land was rich and very populous, abounding in all the necessities of life, and the inhabitants were prosperous, enlightened, and happy. The custom of embalming the dead, not human beings only but animals of all sorts, may have had a salutary influence, by withdrawing so much corruptible matter from putrefaction and decay.* This "salutary practice" (of embalming) was abolished in A.D. 356.† Subsequently to this period, the ignorance and fanaticism of the Mussulmen have brought on that frightful state of moral degradation and physical wretchedness of which we have spoken in a preceding chapter. Is this lamentable state of things always to last, to the disgrace of the country and the injury of the world? There cannot be a reasonable doubt but that, if proper sanitary regulations could be established and duly executed in Egypt, the pestilence might be extirpated, and Egypt rendered as healthy as it was in days of yore. Mehemet Ali is well aware of the truth of this. His convictions on this point are so positive, and already he has acted so well in the right course, that Gaetani-Bey—who accompanies him twice a year in his tours of inspection across the Delta, from Alexandria to Cairo—has not hesitated to declare that, if the Viceroy was not thwarted in the execution of his plans, this great and desirable end might be accomplished.‡

The question proposed in Chapter V. is to the effect whether the present condition of Syria, of Turkey in Europe and Asia, and of the Barbary States has become so much changed or ameliorated, since the time when pestilential epidemics have broken out in them, as to justify any rational expectation that such invasions may not recur. The answer, as might be anticipated, is decidedly in the negative. Wherever the Ottoman dominion has prevailed, civilisation and social improvements have retrograded rather than advanced. We have seen, indeed, that the recently-instituted board of health at Constantinople has attributed the exemption of that metropolis from an invasion of the plague for some years past exclusively and entirely to the establishment of lazarettos and quarantine restrictions

* There seem to be some inconsistencies between a few of the statements in this chapter and those that have been already made, respecting the existence of the plague in Egypt in ancient times. We may remark also that the testimony of Herodotus, respecting the salubrity of ancient Egypt, is said to be at variance with that of other authors more worthy of credit. M. Daremberg informs us that Hæser (*Recherches historico-pathologiques sur les maladies épidémiques*) has collected together a number of texts to prove the unhealthiness of Egypt in ancient times. Compare also Lorinser, *die Pest im Orient*.

† M. Prus suggests, among other hygienic reforms necessary in modern Egypt, the re-establishment of the practice of embalming (!) or of some other equivalent method of counteracting the evils of animal putrefaction in that country.

‡ Sir W. Pym, in a letter addressed by him in Jan. 1845 to the Board of Trade, acquaints us that Mehemet Ali, on being informed that there was a very short quarantine in England against Egypt, replied: "There ought to be no quarantine, it is our own fault. *We must get rid of the plague!*"

there ; but we must not be too ready to yield our unhesitating assent to this opinion.

It is not necessary to adduce any details to shew that the sanitary condition of such places as Erzeroum and the surrounding villages, of Tunis, Tripoli, &c., has not at all improved of late years, so that they should be less likely to be visited by the pestilence than they may have been hitherto. With respect to Algeria (Chap. VI.)—which seems to have been less frequently the scene of spontaneous epidemics of the plague than any of the other Barbary States, in consequence probably of most of the towns and villages being built upon the slopes of hills, and neither crowded together nor over-peopled—there is good reason to anticipate that, under its present administration, it may become as seldom the theatre of the pestilence as almost any of the countries of Europe.*

The answer to the question, proposed in Chap. VII.—*What are the means that should be employed to prevent the development of spontaneous plague?*—must be sufficiently obvious from what has been already said respecting the causes which promote, if they do not induce, the development of the disease in Egypt and elsewhere. M. Villermé has with great ability discussed the general question as to the origin and diffusion of epidemic diseases, and has very satisfactorily shewn that they invariably become less frequent and less destructive in proportion as countries pass from the miseries and degradation of barbarism to the social comforts of civilised life. Dr. Aubert-Roche also has with much care examined this subject, more especially in reference to the plague ; and he comes to the same conclusion. In all times, and in all places, this disease has disappeared before civilisation ; it has returned with a country's decline and barbarism. Everywhere the same causes have produced the same effects.

SECOND PART.

CHAP. I.—*Has the plague always exhibited the principal characters of epidemic diseases, when it has raged with violence in Africa, Asia, or Europe?*

The characteristic features of epidemic diseases are these:—1. They generally manifest in their progress three distinct periods, of commencement, persistence or status, and decline. These periods often display neither the same symptoms, the same lesions, nor the same gravity. 2. During the prevalence of an epidemic, other diseases are less numerous than usual, and they receive the stamp or impression of the prevailing affection. 3. When an epidemic disease prevails, even those persons who retain their health generally feel its morbid influence more or less. 4. Epidemic diseases not unfrequently return and cease at the same season (of the year) ; and they have usually about the same duration. 5. An epidemic disease is often preceded by other affections, more or less severe and more or less widely diffused ; these seem to be in some way its precursors.

* No quarantine now exists in France against Algeria.—G. M.

Now the plague exhibits each and all of these features in a striking manner. Its severity or malignancy is usually most intense on its outbreak, and for the first few weeks afterwards. Pugnet says that, towards the end of the epidemic at Cairo in the year 1800, almost every patient recovered notwithstanding the most opposite methods of treatment, whereas very few indeed recovered upon its first outbreak.* Not to accumulate authorities, we may state that Clot-Bey remarks that, “when an epidemic commences, almost all who are attacked with it perish. During the first period, death occurs within 24 or 48 hours after the invasion; in the second, on the 4th or 5th day, or it may be not till the 14th or 20th. There are scarcely any fatal cases in the third period;” the pestilence having by this time lost its malignancy.†

It must be obvious from this circumstance, how cautious medical men should be in estimating the value of any remedial means in the treatment of such a disease as the plague, and how important it is to pay great attention to the period of the epidemic visitation when these means have been employed. This is a great practical truth, which is far too little attended to in the present day. “At the commencement of the epidemic (1841),” says Dr. Penay, surgeon-major of a cavalry regiment in the Egyptian army, “I lost almost every patient, in spite of my best exertions. Subsequently, several got well without my being able to determine what line of treatment seemed to be of decided benefit. During the decline of the epidemic, nearly all my patients recovered, and the greater number without any other remedy except local applications to the bubos and carbuncles.” The following extract from a report of M. Masserano, one of the members of the Egyptian council of health, is highly illustrative of the same subject.

“While the plague was at its height, almost all the persons who were attacked sunk at the end of four and twenty hours; and such was the violence of the epidemic in some of these cases, that the patients died suddenly while engaged in their employments, as if they had been struck with lightning. The pestilential characters in the middle, and towards the end, of the epidemic were much less intense. The acute cerebral congestions and complete state of prostration were no longer observed; and petechiæ were of rare occurrence. The sick were distressed with restlessness and weariness; exhaustion and headache threw them into a state of stupor. They experienced more or less severe glandular pains, shooting uneasiness in those parts where bubos were expected to appear: these bubos passed readily into suppuration. When the epidemic approached its close,

* *Memoire sur les fiebres de mauvais caractere du Levant et des Antilles.* Paris, 1804.

† The following observations of Sydenham may be aptly quoted here:—

Observare insuper est quod, sicuti epidemicorum quilibet in subjecto particulari suas habet periodos (augmenti scilicet, status, et declinationis) ita etiam constitutio generalis quæcunque, quæ huic alterive morbo epidemice producendo favet, pro ratione temporis quo dominatur, suas etiam periodos habet, quatenus scilicet indies magis et magis epidemice grassatur, donec ακμην attigerit suam, atque exinde iisdem fere gradibus decrescat, donec tandem penitus exoluerit, alteri constitutioni locum cedens. Symptomatum enim quod attinet vehementiam, atrociora sunt omnia ubi primum se ostendit; quæ quidem paulatim mitescunt, et in constitutionis catastrophe tam sunt benigna atque ευφογητα quam patitur morbi natura in quo fundantur.—*Observ. Med.*, sect. iv.

I saw many persons attacked with bubos, without discontinuing their occupations. Two of my servants, among others, were attacked with the disease in a mild form; they pursued their employment without saying any thing to me. At the time when the disease was most intense, we remarked that, out of 22 persons attacked, 10 died; whereas, towards the end, out of 60 seizures only two proved fatal."

What has now been said will abundantly show how truly the plague exhibits the *first* of the characteristic qualities of Epidemic Diseases. We proceed to examine the *second* one which we enumerated; viz. how far are other diseases, that may exist during the prevalence of the pestilence, influenced and modified by it. Diemerbroek, writing of the plague at Nimeguen in 1635-6, uses these words; *vix ullus morbus peste incommittitur*. Pugnet says that "the plague stamps with its own peculiar character all other co-existing diseases." A proof and, at the same time, an effect of this decided influence of the pestilential constitution upon intercurrent diseases is the circumstance that these resume their own proper physiognomy (a remark made three hundred years ago by Prosper Alpinus*), as soon as the pestilence subsides. It would be easy to multiply authorities upon this subject, if it were necessary.†

All medical men, who have had an opportunity of studying the plague in Egypt or elsewhere, have remarked that, during the prevalence of an epidemic, those persons, who have already had an attack of the disease, usually feel pain or uneasiness in the scars of their old bubos and carbuncles, without their general health being much affected; and moreover that all those, who have escaped the disease and remain tolerably well, have still nevertheless experienced a certain feeling of *malaise*;—and even a slight degree of tenderness of the lymphatic glands in the groins and axillæ. This is the case equally with those who are in strict quarantine, or who enjoy free pratique. Dr. Delong, in his account of the Epidemic at Cairo in 1841, observes that, it may be fairly said that the entire population had the plague in its first and mildest degree. So impressionable and sensitive, are those, who have once had the plague, to a pestiferous condition of the atmosphere that, it has been supposed, they can generally predict the approach of the disease by the shooting pains and uneasiness in their old bubonic and carbuncular cicatrices. It is possible that in this way we may find out if a pestilential constitution (of atmosphere) exists, or is impending.

Does the plague exhibit the *fourth* character assigned to epidemic maladies? viz. that of having in general nearly the same duration in different countries, and of appearing and disappearing at epochs which may be determined beforehand?

M. Levison, the Russian Vice-Consul at Alexandria, has drawn up the following statement from the data supplied to him by the Cheik Ibrahim-Bassi:

* *Medicina Ægyptorum*. Lib. 1, cap. 16.

† Sydenham has remarked, in his description of the plague of London, that the ordinary endemic fevers of a country are apt to retain, for a season or two after a severe attack of the pestilence, some of its peculiar and characteristic features or symptoms; *pestilenti aeris diathesi etiamnum ex parte perseverante, nec dum in aliam salubriorem penitus immutata*.

“The most intense pestilential epidemics in Egypt are those which, commencing *sourdement* in November, have reached their acme about the end of February or during March. On the other hand, those, which have not displayed great violence, have always made their appearance in the course of this last month. In the month of June, both one and the other have often ceased.

The malignant plagues of Egypt have usually lasted about four months, whereas the milder ones have in general not exceeded two months, or two months and a half.”

It is a remark as old as the time of Prosper Alpinus, and one which is amply confirmed by the observations of subsequent writers, that the disease in that country almost invariably ceases in the month of June.

At Constantinople, epidemic plague habitually begins in the first or second week of July—during the great summer heats and the prevalence of southerly winds and thick fogs—after or before the arrival of the convoy of merchant ships from Egypt and other places, and usually ceases towards the end of the year. The great plague of 1812, which had been mild up to the end of August, became very malignant in September, carrying off in little more than three months no fewer than 160,000 persons. It entirely ceased by the end of December. At Smyrna, the pestilence generally reaches its height in May, and ceases about the middle of August.

The *fifth* characteristic feature of epidemic diseases—that of being usually preceded by certain precursory maladies—belongs without doubt to the plague. Its outbreaks have been repeatedly observed to be preceded by bad forms of intermittent and continued fevers. “During the winter of 1816-17, there prevailed in this place,” writes M. Berbrugger the learned librarian of Algiers, “a very fatal epidemic that was termed in the bills of health a malignant fever. This has been remarked to be a usual precursory sign of an outbreak of the plague itself, when this reappears after a long interval of time.” Many analogous circumstances might be quoted. That Typhus not unfrequently precedes, and coexists with, the regular plague is admitted by most of the medical men who have resided for some years in Egypt. Dr. Delong, who lives at Cairo, has made the remark of the epidemic of 1841 that the plague often commenced under an intermittent form, intermittents having been prevalent for some time; and that quinine occasionally seemed to arrest the progress of the malady.

Such being the case respecting the frequent precedence of other epidemic affections to the outbreaks of the plague, it must be obvious that medical men may readily fall into a seeming error, if they happen to be consulted respecting the nature of an existing disease, before the proper pestilence has fairly manifested itself. Hence then the necessity of their giving a guarded opinion, whenever there are grounds to believe that a pestiferous state of the atmosphere is impending. Moreover, at the commencement of an epidemic, there are neither bubos, carbuncles, nor petechiæ in most of the cases. Gaetani-Bey has pointed out a very useful diagnostic sign to direct the medical observer under such circumstances. The lymphatic glands, internal as well as external, should be most attentively examined; and if the patient has died of the plague, one or more of these glands will invariably be found to be enlarged and more vascular than usual. The dissections, made at Abouzabel in 1835 by the medical men

who did not then know the opinion of Gaetani-Bey, amply confirmed the justice of his remark.

The facts and observations, adduced in this chapter, lead distinctly to the *conclusion* that “the plague combines in a very marked degree the principal characters of epidemic diseases.”

We shall now briefly look at the causes of pestilential plague considered exclusively in this point of view. These causes, like those of all epidemic diseases, are of two kinds. The first relate to the soil and the atmosphere; the second to the physical and moral condition of the inhabitants.

When Dupuytren enquired of the young Egyptian students, who had been brought by Clot-Bey to Paris for medical education, what was the opinion of the most enlightened men in Egypt respecting the origin of the Plague, the answer they gave was, “*la peste vient de la terre.*” All that is conveyed by such an expression is merely that a humid and marshy soil, more or less covered with decaying vegetable and animal matters, is a powerful cause of the alteration of the atmosphere, and consequently of the disease. Now nothing can better serve to shew the importance of the conditions of the soil, in reference to the production of the plague, than the comparing together of two localities in the same country, inhabited by the same people, and governed by the same laws and customs, in one of which the disease is endemic, while the other remains entirely exempt from its attacks, even although the infected may die within its walls.

“Fayoum is elevated above the level of the sea: Damietta borders upon the shore. At Damietta, the air is hot and damp; at Fayoum, it is hot, but dry. Fayoum is free from marshes; Damietta is surrounded with ponds of fresh and salt water. While at Damietta the cemeteries are in the town itself; at Fayoum, they are at a distance from the dwellings. Here, the water, although not very pure, may be drunk without inconvenience, owing to the quantity of nitre it contains; at Damietta, the fresh water is either mixed with sea-water, or it is rendered impure by excrementitious products, and by animal and vegetable matter in a state of putrefaction. Fayoum is surrounded by the desert of Lybia; Damietta is enclosed by rice-fields, and situated in front of the pestiferous Delta.”

Great atmospheric vicissitudes have also a decided influence on the development and progress of epidemic plague. Larrey, Pugnet, and all other physicians who have seen the disease in Egypt, agree that its attacks are more frequent, and its mortality greater, when the air is warm and moist, and when the weather has been stormy. At Constantinople, the same causes produce the same effects. We shall not enlarge upon this subject; but only add that it has been too generally supposed that it is to some causes, either actually or recently existing, in the condition of the soil, the atmosphere, or the kind of food, that we must refer the morbid effects observed. And yet, as remarked with his accustomed sagacity by Baron A. Humboldt, the most favourable cause for the development of epidemic diseases is to be found in a uniform and long-continued type of meteorological phenomena. For example, in the case of the plague, it is after a lengthened duration of the same temperature and of the same winds that the pestilence, in an epidemic form, has been observed to break out in Egypt, Syria, and at Constantinople. It may be readily believed that, when a population has lived for a length of time in the same conditions of

climate, atmosphere, alimentation, &c., the system of each individual becomes profoundly modified in the same manner, and may be disposed to receive, or even to develop spontaneously, the same disease. Perhaps it is in this way that we may account for what has been very positively asserted to be the case by some authors, but denied by others, viz. that persons, who have been long exposed to the same physical influences, may become affected with the same disease at a given period, although they are then far distant from each other.

The action of epidemic diseases is observed to vary much in point of degree or intensity in different races of mankind, when exposed to the same morbid influences. No fact has been more clearly proved than the very peculiar predisposition of negroes to contract the plague. To Dr. Aubert-Roche we are indebted for the following table of the relative mortality in the different races, during the great plague at Alexandria in 1835:

Negroes and Nubians lost	. . .	1528	out of 1800 = 84 per cent.
Malays	. . . . .	367	„ 600 = 61 „
Arabs, not soldiers	. . . . .	10,936	„ 20,000 = 55 „

The Negroes, Nubians, and Arabs were all living in nearly the same hygienic conditions, and were all in free pratique. With respect to the other residents in Alexandria, our conclusions must be more uncertain, in consequence of the very great difference in point of hygienic condition, isolation, &c., enjoyed by different classes of the population. Here, however, are Dr. Roche's calculations :—

Greeks	. . . . .	lost	257	in 1800 = 14 per cent.
Jews, Armenians, and Copts	. . . . .		482	„ 4000 = 12 „
Turks	. . . . .		678	„ 6000 = 11 „
Italians and others from the South	} of Europe }		118	„ 1600 = 7 „
French, English, Russians & Germans			52	„ 1000 = 5 „

These figures carry with them their own signification. It is scarcely necessary to say that the liability to the attacks of the pestilence among all classes of the population, native or stranger, is almost uniformly observed to be inversely proportionate to their cleanliness, good living, and general comfort. An instructive illustration of the truth of this is afforded by Dr. Roche.

“ On the banks of the canal, which leads from Alexandria to the Nile, lies a property belonging to the Greek consul, M. Tortizza, who received it as a present from the viceroy. The fellahs who work upon this property, being better treated and better fed than the fellahs of the surrounding villages, only lost, during the epidemic of 1835, 12 out of 400; while their neighbours, placed in the same conditions with respect to atmospheric influences and free communications, lost one half of their number.”

Having most satisfactorily shewn that the Plague must be placed in the first rank of epidemic diseases, M. Prus makes the following general reflections upon the subject :—

“ The epidemicity of the plague is in truth the fundamental fact of its history,

that which most merits the attention of the physician, and which can alone make him comprehend a number of points which, without taking it into account, remain in complete obscurity. The certainty that the plague is a disease which is epidemic in a marked degree, will suggest another consideration to the mind of the physician. It will furnish him with the means sometimes of preventing, and always of diminishing, the ravages of the pestilence. If the existence of epidemic *foci* of plague is satisfactorily demonstrated, things will not affect in the same manner those who remain in or who come into these *foci*, as they do those who are placed, or who remove themselves, beyond their influence.

“ Every person remaining in an epidemic focus of plague is exposed to contract this disease. Numerous and authentic facts, observed in Egypt during the years 1835 and 1841, have proved that the most complete isolation and the most severe quarantine do not always preserve those who submit to them. The same remark had been made in as positive a manner at Marseilles and at Toulon, at the time of the plague of 1720.

It requires sometimes but a very short period to be passed in an epidemic focus to become affected with the plague. The professors of the school of medicine at Abouzabel,—which, in 1835, was not attacked by the epidemic influence for more than a month after the capital was ravaged by the disease,—have seen inhabitants of that place, who have only remained a few hours at Cairo, return infected.

“ Now, what will happen to persons in health, or already affected with the plague, who shall remove from or be taken beyond the epidemic focus? Before answering this question, we must receive it as a fact recognised by science that, in the most wide-spread and severe pestilential epidemics, experience has shewn that all the localities of the same country have not been subject at the same period to the epidemic influence. It has been stated a hundred times that, by the side of a town ravaged by the plague, other towns in free communication with it continued exempt from the disease. Nay more, plague-patients out of infected towns have come either to die or to be cured in localities where the epidemic influence did not prevail, without the disease having spread. We shall find numerous examples in support of these two propositions, both in the works of modern writers on the plague, and in the documents annexed to this report. Observation has also taught us that it is often tolerably easy to determine the limits of the epidemic focus. This may be circumscribed within the limits of a single town, as Pagnet remarked at Damietta at the time of the plague of 1799, or as was seen at London in 1665, notwithstanding that in both instances the communication with the neighbouring towns remained perfectly free.

“ This being established, we may assert, in answer to the question stated above, that, when a population is struck with a pestilential epidemic, persons, whose duties and interests do not require them to remain in the midst of the epidemic focus, will escape the danger by withdrawing from the infected district.

“ In 1835, when the epidemic constitution prevailed at Cairo, Gaetani-Bey advised that the 22,000 of the soldiers on active service, composing the garrison, should be sent some leagues from the city, and be encamped under tents in a dry and airy situation, leaving only 2000 invalids for the service of the city. The plague did not commit any ravages among the active troops, whereas it raged among the 2000 invalids as it did among the rest of the population.”

Some time before this, Clot-Bey had given a similar advice respecting the fleet which was in the harbour of Alexandria. Although put and kept in severe quarantine, the pestilence made its appearance on board some of the ships, while they remained exposed to the epidemic influence. Not a single case occurred, when the fleet was withdrawn from the focus.

In 1813, Sir Thomas Maitland the Governor of Malta, finding it impossible, in spite of the most severe measures, to extinguish the plague

which then prevailed at La Valetta, took the resolution to have barracks constructed fairly out of the city, and obliged the population forthwith to occupy them. From that moment the plague entirely ceased.

Dr. Masserano has related a similar instance with respect to his regiment in garrison at Damietta in 1841 ; removal to a healthy spot at once put a stop to the disease.

The enlightened portion of the inhabitants of Cairo and Alexandria has already begun to discover the inutility of quarantine within their own dwellings, and now trusts for safety only to removal beyond the sphere of infection. The Persians have long acted upon this principle, and have no doubt found its advantage.*

Removal from an epidemic focus has been found to be most useful, not only in preserving the unattacked from the pestilence, but also in promoting the recovery of those who have caught it. On this latter point, Dr. Delong observes in reference to the plague of 1841 :

“ When I had the good fortune to be called at the onset of the disease, I instantly ordered a change of abode ; whenever it was possible, I caused my patients to be removed to situations that were elevated, dry and airy. The disease then almost always assumed a more favourable appearance, and the morbid phenomena were found less to resist the combined action of nature and of a sound method of treatment.”

A similar remark was made by the medical men at Abouzabel in 1835, and it has been repeated by M. Penay in the history of his patients in 1841. The *conclusion*, to be drawn from the numerous facts and observations that have been adduced in this chapter, is surely that,

“ Whenever the plague has raged with violence in Africa, Asia and Europe, it has always exhibited the principal characters of epidemic diseases.”

CHAP. II.—*What are the differential characters between Epidemic and Sporadic Plague ?*

The medical men residing in Egypt, as well as those at Smyrna and Constantinople, agree, almost without exception, that the sporadic form of the disease is not transmissible ;† whereas, with respect to the epidemic form, many of them hold the opposite opinion. This is, indeed, just what might have been expected, for it is in exact accordance with the views entertained by most observers on other analogous diseases (Dysentery for

* Lacheze, *Memoire sur la peste en Perse*.

† The testimony of Dr. Laidlaw, who has resided so long in Egypt, and seen so much of the disease, is very strong upon this point :

“ I have no hesitation whatever,” says he, “ in expressing my decided conviction that, unless the state of the atmosphere is favourable to the spread of the disorder, as is undoubtedly the case during the epidemic, there is no danger whatever from these causes, that they were purely accidental, and that it is impossible to produce by them the spread of the disorder. I have never seen a case of plague occurring sporadically where any person about the patient or in contact with him was attacked ; and I cannot find any one that has *seen* one, although it is talked of among the Levantines as a common occurrence.”—*Dr. Bowring's Observations*.

example), which occur at one time sporadically, and at another time epidemically : in the former case, the malady is not transmissible ; in the latter, it is often so in a very high degree.

If we admit the accuracy of this opinion, it will be obvious how important it must often be for a medical man to determine if a case of plague be simply sporadic, or if it be connected with a pestiferous constitution of the atmosphere. As a matter of course, this point cannot be fairly determined by a mere summary or off-hand enquiry ; things must be carefully watched for some time, before a decided opinion is given. If the disease be limited to a few isolated cases, and if these occur only in the localities where the pestilence arises spontaneously, there will be reason to believe that its type is merely sporadic. The disease too is usually less malignant in this than in the epidemic form. The sporadic plague does not exhibit in its course the three regular periods of commencement, persistence, and decline ; nor is it preceded by other epidemic disorders. Moreover, other maladies are not less numerous than usual, nor do they display anything of the prevailing pestilential stamp or impression ; persons in health do not experience the effects of an atmospheric influence acting in an especial manner on the lymphatic system ; and lastly, whereas the epidemic form of the disease commences between November and February, and ceases about the end of June, the sporadic form is observed in every month of the year. The *conclusion* is therefore very fair and obvious that “ Sporadic differs in some very important respects from Epidemic plague.”

CHAP. III.—*Does the plague extend, like most epidemic diseases, by the migration of certain atmospheric influences, and independently of the agency of the sick who are affected with it ?*

Whoever examines with attention and candour the histories of many epidemics of the plague, can scarcely fail to observe that the disease has often broke out about the same time in a number of different localities, distant from and having no intercourse whatsoever with each other. Always originating in unhealthy spots under the influence of those causes which have been already mentioned, the epidemic pestilence may be either confined within the circuit of a single town or city, although this remains in free communication with the surrounding district, as occurred at Damietta in the year 1799 ; or else it may become diffused over a number of countries, as in the formidable epidemics of 542 and 1348. It is scarcely necessary to adduce further instances to prove that the localities and districts, immediately adjoining to an infected spot, often remain quite exempt from the disease. Not unfrequently several towns are attacked about the same time, the intermediate villages remaining quite free ; at other times, the pestilence advances in a more regular manner, attacking a number of places “ *de proche en proche* ” and in succession.

Clot-Bey and Dr. Roche are of opinion that the plague may traverse seas, and pass from one continent to another—from Alexandria to Marseilles, for example—through the medium of the atmosphere alone. On the other hand, that it may meet with insurmountable obstructions not far from the spot where it has arisen, would seem to be the case from the well known fact that the plague of Lower Egypt never passes beyond the first Cataract of the Nile. In some malignant epidemics, indeed, the dis-

ease spreads into districts that are very generally spared. This has been observed at certain periods in Upper Egypt and the Hedjaz.

It appears that the plague never extends to a great elevation above the level of the sea. There is a village about five leagues from Constantinople, situated on the mountain of Alem-Daghe at an elevation of about 500 *metres*, where the pestilence has never been known to exist: it serves, indeed, as a place of retreat to the inhabitants of the Turkish capital during the prevalence of an epidemic. On the same mountain, but at a less elevation, there is another village that by no means enjoys the exemption of the first. There is a spot in Malta to which the plague has never reached; from this circumstance it has received the name of *safi* (pure). According to the testimony of Desgenettes and Clot-Bey, the Citadel of Cairo, which stands upon a lofty eminence, has uniformly escaped during the worst epidemics that ever raged in that city.

A most important question here suggests itself to our consideration; viz: *When a pestilential epidemic prevails in a place, how many cases of the disease are to be attributed to the influence of the epidemic constitution, and how many either to the absorption of the miasms emanating from the sick, or to direct or indirect contact with them?* As may be imagined, the solution of this problem is attended with many difficulties. Dr. Lacheze, when physician of the hospital at Cairo in 1835, endeavoured to determine the point. According to the observations of this gentleman, not more than one person in 400 of those who were entirely isolated or in quarantine was attacked; whereas the pestilence of that year carried off no fewer than one in three of the general population, that remained in free pratique. Without disputing the accuracy of the figures given by this gentleman, it is the opinion of many able observers that they should be interpreted very differently from what M. Lacheze has done; at all events, it must never be forgotten that the very persons, who put themselves in quarantine during the prevalence of an epidemic, are precisely those who enjoy the greatest comforts of life and pay most attention to a hygienic regimen. The Commissioners were therefore desirous of obtaining if possible some less objectionable data for comparison, and it occurred to them that the best plan would be to ascertain the results in some large public establishment, either at Cairo or Alexandria, the inmates of which were living in very nearly the same conditions as the rest of the population out of doors. For this purpose, the Arsenal at Alexandria, which always contained 6000 workmen at the least, was selected for observation. Now, what has been the result of their enquiries? The words of the report are these:

“In this establishment, no attack could be attributed to an accumulation of pestilential miasms. Such an accumulation never existed; for, whenever an invalid was discovered to be infected, he was instantly taken into an hospital situated without the arsenal. Neither could contact with those infected be regarded as the cause; since, whether from the invalids having been removed at the beginning of the disease, or from quite a different cause, the neighbours of those who were seized with plague, as well as those who had touched them, were never attacked with the disease. The number of workmen at the arsenal, removed to the hospital on account of plague, gives us then that of the cases attributable to the epidemic, apart from any other, agency. Now 300 workmen having been attacked with the disease in a total of nearly 6000, we may fairly believe, that the epidemic influence alone acted upon one individual in every twenty. This proportion is

without doubt very different from that pointed out by M. Lachèze; but it also varies very considerably from that furnished by the population in free pratique; for this at Cairo and Alexandria, as we have already seen, lost one in every three. Are we to believe, with Clot-Bey, that the difference of hygienic condition completely accounts for these facts, and that, if the mortality among the workmen in the hospital did not amount to one in every three of their number, this was solely owing to their having been kept cleaner and better fed than the rest of the working population at Cairo and Alexandria?

“While we readily recognize and publicly admit the very great power of hygiene in preventing and moderating the ravages of the plague, we must at the same time distinctly state that the deductions drawn by Clot-Bey appear to us to exceed what the facts warrant.

“Neither can we assent to his final conclusion, that all cases of plague should be attributed to epidemic influence alone. We must reject this conclusion, on the one hand, because it does not appear to us to be based upon positive and satisfactory proofs; and on the other hand, because, if it were rashly received, it would have the serious inconvenience of checking all enquiry into those causes, which, secondarily, tend to propagate the plague, and increase its fatality. In science, a false explication is less dangerous in that it extends error, than that it impedes the search after truth.

“From the facts and considerations contained in this chapter, we think we are fairly justified in drawing the following *conclusion*:

“The plague, abstractedly from the influence which the infected may exercise, spreads itself after the manner of most epidemic diseases, viz. by the action of general causes.”

THIRD PART.

We now approach the question of the transmissibility of the plague, away from or beyond, as well as within, epidemic foci—a question, we need scarcely say, of the highest importance and, at the same time, of very difficult solution. The first point that we shall discuss is this:—

CHAP. I.—*Is the plague transmissible by inoculation either of the blood drawn from a vein, or of the pus from a bubo, or of the serosity from the phlyctena of a carbuncle?*

“It is obvious,” says M. Prus most justly, “that if the plague be truly a virulent disease (*à virus fixe*, to use the expression of certain writers), the possibility of the inoculation of its virus would approximate it to epidemic contagious diseases; whereas if it does not furnish any principle, liquid or solid, that is susceptible of being inoculated and of producing a virus similar to that which gave it birth, the disease must be withdrawn from the class of diseases that are properly contagious, such as Small-pox, and would approach in this respect the character of Typhus, which is propagated by peculiar miasms, but which gives out no inoculable element.”

And here it should be noted as an important fact that, if the diseases which are indubitably *contagious*—Small-pox, Hydrophobia, Glanders, and Syphilis, for example—all present us with a palpable liquid which contains the poisonous principle, such is certainly not the case with the Plague. Hence medical men have operated, by turns and almost indifferently, with

the pus of a bubo, the serosity of a carbuncle, or even with the blood itself of a pest-patient.

The experiments that were made in Egypt by Desgenettes, Whyte, and a few other physicians, about the beginning of the present century, to ascertain the effect of the direct inoculation of the matter taken from plague bubos, are anything but satisfactory or conclusive. We shall therefore not dwell upon them, but at once proceed to notice those which were instituted in 1835 at the Cairo Hospital in the presence of Gaetani-Bey, Clot-Bey, and Drs. Lacheze and Bulard, and which are deserving of all confidence.

Five criminals, who had been condemned to death, were the subjects of the experiments. A lancet, wetted with the blood drawn from a pest-patient, was passed under the epidermis on the inside of the arm of one of these criminals, at two different points. On the third day afterwards, the man was affected with confirmed plague—so, at least, says Dr. Lacheze, who reports the experiment; Clot-Bey thought the case doubtful. Three days subsequently, the man was convalescent.

In three other cases, no effects followed the inoculation of the blood. In two cases, the serosity from a carbuncle, and in one the pus from a bubo, was used for the purpose of inoculation: in none of these cases, was the disease induced.

With respect to the single case, in which the disease (mild indeed) occurred after inoculation with the blood of a pest-patient, it must be kept in mind not only that the man was exposed, as a matter of course, to the epidemic atmospheric influences then existing in Cairo, but also that, for three days before the performance of the experiment, he had been living in a pest-hospital, which was necessarily a focus of pestilential infection.

Clot-Bey inoculated himself, in six different punctures, with the blood of a pest-patient: no constitutional effects followed. A few days subsequently, he inserted some pus from a bubo on the inner part of his left arm: this was followed by a slight indisposition, which he attributed to the absorption of the purulent matter, but which bore no resemblance to the symptoms of plague.

The results of certain trials made by Professor Pruner in 1829, and by Dr. Rossi in 1841, were altogether similar.

The general *conclusion* of the Commissioners upon the important point under consideration is to this effect:

“The results of the inoculation of the blood drawn from the vein of a plague patient, or from the pus of a pestilential bubo, have been equivocal; the inoculation of the serosity taken from the phlyctenæ of a pestilential carbuncle has never given the disease. It is therefore not proved that the plague can be transmitted by inoculation, even under the influence of a pestilential constitution.

“We are not acquainted with any experiments that have been made upon the same subject, at a distance from an epidemic focus.

“It is useless to observe that the study of the effects which might have been obtained from inoculation of the plague, a study so important for the knowledge of the nature of the disease and consequently of its transmissibility, presents, nevertheless, no direct application to the question of quarantine. There can be no fear that the mass of a population will ever allow themselves to be inoculated with the plague.”

CHAP. II.—*Is the plague observed, in epidemic foci, to be transmissible by immediate and direct contact with the sick?*

The Arabian physicians, as well as their predecessors, regarded the disease as purely and simply epidemic, and seem therefore not to have troubled themselves in seeking to determine if the disease be communicable from one person to another. We must come down to the middle of the 15th century, the time of Fracastorius, before we meet with any formal exposition of this doctrine. The celebrated physician of Verona recognised three modes in which the plague may be communicated:—1, direct contact with the sick; 2, the infection or contamination of goods, clothes, &c.; and 3, diffusion of morbidic miasms through the atmosphere. The relative frequency of these three modes was believed to be in the order that they are here enumerated; the first being supposed to be by far the most common, and the last to be comparatively very rare. These opinions of Fracastorius prevailed almost universally down to the year 1720. In that year, Chicoyneau, Verney, and Deidier of Montpellier maintained with considerable eclat the doctrine of the non-contagiousness of the plague; they regarded it as purely epidemic. Their chief argument was, that they had touched the bodies of plague-patients without taking any precautions, and that they had not caught the disease. The opposite and older opinion, however, continued to be very generally held in the schools.

In 1771, Mertens, Orræus and Samoilowitz, who had an opportunity of watching the plague at Moscow, declared their belief that it was propagable only by direct or indirect *contact* with the infected, and never through the mere medium of the air. Stoll, however—who is characterised by Dr. Prus as the most able observer, after Hippocrates and Sydenham, of epidemic diseases—was not at all satisfied with the prevailing opinions on the subject in question, and pointed out in the following (ironical?) passage the necessity of re-examining them with care and candour.

“He who would deny,” says this truly enlightened physician, “the contagion of the plague, and attribute a very grave disease to an epidemic cause, acting equally upon all, but not producing equally upon all the same effects, and would ascribe it either to the constitution of the year, or to an alteration in the air more fit to produce putrid diseases than in other years, that person, I say, would assert (what would be considered) a paradox. But, at the same time, whatever truth he might utter, and whatever service he might render in the calamitous conjuncture, it were well for him to be at a distance. He, who would hold this opinion, might find abundance of arguments, which could not be refuted, in all the authors who have written on the plague, even in those who have advocated contagion; unless, indeed, the love of the marvellous should make him despise or overlook the most simple causes, which he might find at his very feet.”

All the medical men who accompanied the French expedition to Egypt, Assalini alone excepted, were of the opinion that the plague is propagated by *contact* with the infected. For nearly forty years after their return, this opinion has been universally received, and acted upon. It was not till 1835, that a change of sentiment began to be manifested among medical men on this most important subject. In the course of that year, as we have already seen, a number of European physicians had an opportunity of studying the terrible pestilential epidemic that ravaged Egypt. Impressed at first most firmly with the belief of the transmissibility of the

disease by contact with the sick, they have all, with scarcely one exception, completely changed their opinion; as, indeed, MM. Brayer and Cholet, who had observed the epidemics of 1819, 1826, and 1834 at Constantinople, had previously done. The writings of these last-named gentlemen, and subsequently of Clot-Bey and Aubert-Roche, have mainly contributed to effect this very remarkable revolution in medical doctrine. We shall briefly note a few of the most interesting facts, which have been of late years made public.

During the pestilence of 1824, upwards of 30,000 persons died in Cairo, while not more than two or three cases occurred in Alexandria, although the communication between these two cities was constant and uninterrupted. In 1834, on the other hand, the plague broke out and continued in Alexandria for a very considerable time, before it made its appearance at Cairo; and it had existed for fully eight months in the former city, before there was any sign of it in Mansoura and Damietta, although the daily intercourse between these places remained entirely free. Dr. Coch, principal physician of the Egyptian fleet, mentions an interesting fact observed by him in 1835. Ten men had gone from Sakkarah, a populous village, to Cairo, where the plague then existed. On their return home, every one of these men sickened, and died; yet not a single member of their families, who had assiduously waited upon them, took the disease. "Such a fact," it is emphatically added, "was observed hundreds of times during the course of this great epidemic." The same gentleman states that, the Viceroy having ordered that all vessels in which the plague appeared should be subjected to a quarantine of 11 days, the sick were immediately disembarked and carried on shore by the sailors of the fleet; and, although these sailors returned on board and communicated freely with the rest of the crews, not a single case of infection was the result.

We owe the following facts to Dr. Roche. The ports of Suez and Cosseir on the Red Sea draw the chief supply of their provisions, the one from Cairo, the other from Keneh in Upper Egypt. In 1835, the plague broke out at the latter place about the same time that it made its appearance at Cairo. Suez was attacked by the pestilence; but Cosseir remained quite exempt. The first of these places is surrounded by stagnant marshes, a state of things not unlike to what exists in all the towns of the Delta; the second is built upon rocks, and is surrounded by bare arid hills. During this epidemic, Djedda, Yambo, and Moka enjoyed the same immunity as Cosseir, although the sick from Suez and other infected localities often died in the midst of them. Still more convincing is the following statement:—

Every year pilgrims depart from all parts of the country, subject to the laws of Mahomet, to go to Mecca. Caravans from Morocco, Darfour, Egypt, Constantinople, Persia, Asia Minor, and Syria converge at Djedda, at Medina, then at Mecca, the central point. They carry merchandize with them, for this pilgrimage is also a fair. Has the plague ever broken out at the place of meeting of all this population and all this merchandize, which have often, be it remembered, come from places infected by it? No. On the contrary, it is proved that, from time immemorial, the plague has never been seen in Arabia. The epidemic plagues, which desolated a great part of Lower Egypt in 1825 and 1835, had not one victim in

Arabia, notwithstanding the daily and perfectly free communication which existed between these countries. This has also invariably been the case with respect to the pestilential epidemics of Constantinople, Smyrna, or Syria. The Arabian historians pretend that their country owes this immunity to the protection of the Prophet!

Nubia, Sennaar, and Abyssinia, notwithstanding their close connexion with Egypt, are not acquainted with the plague. If it may be said regarding Arabia, Sennaar, and Nubia, that the heat in these places prevents the condensation of pestilential miasms; the same reason cannot be alleged for Abyssinia, which is a temperate country, the thermometer varying from 16 to 25 degrees Cent. above zero. Here the salubrity of the climate alone serves to keep the disease at bay. Abyssinia is a mountainous country with inclined plains, where there are neither marshes nor stagnant waters.*

For the extract which follows we are indebted to the work of Clot-Bey; allusion has been made to it in a former page.

“During the five months that the epidemic of 1835 lasted, MM. Gaëtani, Lachèze, Bulard, and myself at Cairo, MM. Duvigneau, Scisson, Perron, Fischer, at Abouz-Abel, and MM. Rigaud and Aubert, at Alexandria, visited the infected in the hospitals and in private houses. None of us took the least prophylactic precaution. We were in immediate contact with the sick during all the stages of the disease. We received upon our clothes and upon our hands the matter that was rejected by vomiting, the blood of those who were bled, the pus from the thousands of bubos which we opened. More than a hundred dissections were made at Cairo, and we passed whole hours in endeavouring to detect, in the bodies of those who had just expired, the pathological alterations which had hitherto been so little attended to. The same researches were made with equal care at Alexandria.

“Dr. Rigaud is the only one among us who fell a victim to the reigning epidemic.

“It is remarkable that many physicians, who scrupulously avoided all contact with the sick and with suspected objects, were attacked with the plague and died. Of this number are Dr. Mannucchi, sen., Leopold and Lardoni.”

The observations made by different medical men, during the subsequent epidemics of 1837 in Syria and of 1841 in Egypt, amply confirm these statements of Dr. Roche and Clot-Bey. M. Granet was the chief medical officer of the troops stationed in the province of Adana (Upper Syria), when the plague broke out there in 1837. He was entrusted with all the sanitary regulations ordered by the governor. At first, it was attempted to arrest the extension of the pestilence by establishing a cordon around the infected spot. This was speedily found to be wholly useless: Upwards of 15 new cases were received every day into the military hospital, in which there were usually from 40 to 60 cases at a time. No precaution to guard against the risk of contagion was employed either by the medical men or by the other attendants of the sick; and yet not a

* Aubert-Roche, *ouvrage cité*, p. 100.

single case of the disease occurred among them, although the epidemic lasted for three months. "How can we believe," says M. Granet after relating these particulars, "that, if the plague be really transmissible by contact with the sick, we should not have had a single instance of this transmission?"

The evidence of Dr. Ibrahim, a native physician of Cairo, is highly satisfactory and convincing. He adduces many cases where one member only of a large household was affected with the plague, although the patient had been waited upon by the whole body of the domestics. The case of the wife of Hassan-Pacha, who died on the 35th day of the disease, is more than usually instructive; she had no fewer than two dozen white and black slaves, two keios, two eunuchs, and four pages, in constant attendance upon her!

Dr. Delong also and M. Euzieres report many cases that occurred under their own immediate notice in Cairo, during the epidemic of 1841, in which the relatives of the sick, who had most assiduously nursed them up to the hour of death, entirely escaped. It seems unnecessary to give the details of any of them. In two cases, one of which proved fatal on the fifth day of the attack, the patients continued to suckle their infants; the children were not affected. In several instances, the disease attacked those who had sequestered themselves by the most strict quarantine from all communication with the city; while others of their household, who were less timid, remained intact.

The testimony of Dr. Arnoux, surgeon-major of the 43rd regiment (Egyptian army) stationed in 1841 at Nabaro, of Dr. Dieterich of the 5th at Damietta, of Dr. Penay of the 5th cavalry at Neguille, and of Dr. Chedufau, chief physician of the central military hospital at Cairo during the same year, all serves to prove that the immediate attendants upon plague-patients are, on the whole, very rarely infected;—always provided due regard be paid to the ordinary hygienic precautions. The last-named gentleman informs us that, in consequence of there being no separate plague-hospital prepared when the pestilence broke out, the sick were received at first into the general hospital along with the other patients. There were no fewer than 182 cases of plague treated in this hospital; and, although the number of the ordinary inmates and attendants during this period amounted to 2,000, no instance of infection could be directly made out. None of the "officiers de santé," consisting of 92 Europeans and 300 Arabs, remained in quarantine, but waited upon the sick without taking any precautions. Only three of the Europeans were attacked; and, of these, two recovered. Three also of the Arabs suffered; they all died. M. Chedufau himself, besides his hospital duties, treated many cases of plague in the town, opening bubos, dressing carbuncles, and executing all the necessary medical duties to his patients. He performed, moreover, 17 *post-mortem* examinations. During the whole of the epidemic, he was in continual intercourse with the members of his own family; and yet, although no preservative means were employed, neither he nor any of his household suffered.

The experience of Dr. Perron, the director of the medical school at Cairo, confirms in every respect the truth of these statements. Not one

of the professors or pupils, who were in daily attendance upon the sick, was infected.*

After relating numerous other facts and statements, all bearing upon the question proposed at the beginning of this chapter, the *conclusion* is at length arrived at, that,

“ On the one hand, immediate contact with thousands of plague-patients has not been followed by any dangerous consequences to those who have been exposed to it in the open air or in well-ventilated chambers ; and on the other, that there is not a single fact which indisputably proves the transmissibility of the plague by mere contact with the sick.”

CHAP. III.—*Is the plague transmissible by contact with the clothes or effects of the sick, in localities which are, or have been, recently exposed to the epidemic influence ?*

After the plague of 1835 at Cairo, the clothing, effects, &c. of upwards of 50,000 plague-patients, who had been carried off by the pestilence, were sold in the public bazaars, without communicating, as far as is known, the disease in a single instance. More than 600 houses remained tenantless for several months after this frightful epidemic ; they were then ordered to be visited, and an inventory taken of their contents. Not one of the persons engaged in this service fell sick.

Three thousand plague-patients were received into the large hospital of Esbequière during the year 1835. On the cessation of the pestilence, the ordinary class of patients was admitted and put into the very same beds, which had been occupied by those who had died of the plague. The sheets indeed were changed, but the coverlets, which had never been subjected to any process of disinfection nor even freely exposed to the air, were used without alarm. No case of infection ensued. These facts were made known in 1840 by Clot-Bey, and have not since been disputed by anyone.

Dr. Brayer informs us that it is a fact perfectly well known in Constantinople, that the Jews buy up the clothes, &c., of persons who have died of the plague, however virulent this may have been, for sale at Fit-Bazar, where most of their stores are. No one dreams of using any means of disinfection, If the deaths be numerous, the bazaar is full ; and *vice versa*. All the poorer classes resort thither for their clothing ; and, generally, bundle after bundle is turned over and examined, before a purchase is made. In 1812, the “depouilles” of 150,000 victims of the dreadful pestilence of that year were brought together into that market ! One portion was speedily bought by the inhabitants of the city ; another portion was forthwith sent away into all the principal towns throughout the Turkish dominions ; while what remained unsold was kept in close confined magazines, to be disposed of next year. Notwithstanding this dispersion of infected *fomites* to such a vast extent, nothing was heard of the spread of the pestilence thereby. It deserves also to be noticed that a smaller proportion of the Jews died than the Greeks, who, we may remark, have always had great fear of the contagion of the plague.

* We shall afterwards however find it stated that most of the *pharmaciens* in one of the hospitals at Alexandria caught the disease and died, and also that very many of the pupils in the hospitals at Cairo perished.

It would be easy to mention many other instances where the clothing, goods, equipage, &c. of persons affected with the plague have been taken possession of by others, without any injurious results. But this is unnecessary; suffice it to say that, in Egypt, Constantinople, Smyrna, &c. an epidemic of the plague is almost invariably found to subside and cease at a certain period known beforehand, whether any sanitary regulations have been taken to arrest its course or not; and that then the clothes and other property of the victims freely circulate in the bazaars of the place. If these objects communicated the disease to those who handled them, it is quite obvious that it would last much beyond the period at which it disappears with a truly remarkable regularity.

Such are some of the facts that have led most of the medical men resident in the East to believe, that the plague is not transmissible through the medium of *fomites*. Even although we do not go so far as this, it may surely with perfect truth be asserted, that in a vast number of instances, some of them indeed of almost continual recurrence, the pestilence has not been communicated by touching, or even wearing the apparel of those who have died from it, although no means of purification or disinfection had been employed. We are not prepared utterly to deny that the disease has been, and may be, sometimes transmitted in this way;* but after the striking facts which we have mentioned, we may very fairly withhold our credence from many of those histories on record of the plague having arisen in places previously quite healthy, from the introduction of infected objects. Most of the reported facts of this description appear to have been dictated by prejudice and accepted with credulity. Nevertheless, it must be admitted that some medical men, who have had extensive opportunities of observation, still maintain the opposite opinion. Of these, M. Grassi, principal physician of the lazaretto at Alexandria, and who has been in the Egyptian service for upwards of 20 years, is the person whose opinion is entitled to perhaps most consideration. We may state, however,

* Clot-Bey himself reports the following narrative:—

“On the 15th of April, 1835, (in presence of MM. Gaetani, Clot, Lacheze, and Bulard) two young criminals, Ibrahim-Assan and Ben-Ali, in perfect health at the time, were placed in beds which had just been left by patients affected with well-marked plague.

“In the night of the 18th, Ibrahim’s pulse was slightly affected.

“The following day, he had the plague with bubos and carbuncles; he died on the 23rd.

“On the third day after he was in bed, Ben-Ali also felt the ordinary symptoms of an attack of the plague; but the disease abated, and convalescence began from the fourth day after the appearance of the characteristic symptoms.

“That Ibrahim-Assan died of the plague, after having slept in a bed recently left by an infected person, is a fact. But was it the sheets or other coverings of the bed which gave the disease? This is uncertain. Ibrahim-Assan was in a town where a pestilential epidemic raged; he was in a hospital which had contained and did still contain a great number of plague-patients, and in which several medical pupils and attendants had contracted the disease. It cannot then, in his case, be absolutely asserted that the plague developed itself by contact with contaminated objects, rather than by epidemic influence alone, or by miasmatic infection.”

that the accuracy of many of the facts, which he has adduced in favour of his views, has been disputed or denied by Clot-Bey and others.

The general *conclusion*, to which the Commissioners have come, after a laborious investigation of all the particulars, is that

“ Very numerous facts prove that the clothes and effects, belonging to plague-patients, have not communicated the disease to persons who have used them, even without any previous purification. The facts, which seem to indicate an opposite result, can only be considered valuable, if they are confirmed by fresh observations made beyond epidemic *foci*, at a distance alike from *foci* of miasmatic infection and from countries where the plague is endemic.”

CHAP. IV.—*Is the plague transmissible, in countries where it is endemic or epidemic, by merchandize suspected to contain pestiferous matters ?*

It will be obvious that it must be very difficult to decide this point in places where the pestilence is indigenous, and where it is, therefore, liable to be developed spontaneously at any time ; for what may be attributed by certain persons to handling some description of goods, may be altogether owing to the influence of an endemic cause. The case related by M. Sicard of Marseilles to M. Prus is unsatisfactory in several points of view, and nearly the same thing may be said of all the analogous examples which have been made public. It may, therefore, be very fairly set down that the transmissibility of the plague, under the circumstances mentioned, has at all events not been proved.

CHAP. V.—*Has the plague been observed, in epidemic foci, to be transmitted by the air being charged with pestiferous miasms ?*—in other words, is the plague infectious through the medium of the atmosphere during the prevalence of an epidemic pestilence? Until of late years, the question of atmospheric *infection* had been altogether superseded by and merged in that of direct and immediate *contagion*. We need scarcely say that it can never be an easy thing to determine with exactitude the infectiousness of any disease, while a pestilential constitution of the atmosphere exists, and when consequently a whole population is exposed to the morbid influence. As we have previously remarked, scarcely a single person escapes *in toto* the effects of the malarious condition of the air ; they are experienced by all to a certain degree during the prevalence of the epidemic.

We shall first enquire if the air of a plague-hospital has seemed to give the disease to those, who had most carefully avoided all contact with infected persons or objects. That great mortality occurred among the *pharmaciens* and attendants in the plague hospitals at Cairo and Alexandria during the pestilence of 1835, notwithstanding the use of all precautionary means to avoid direct contact with the sick, or of any thing belonging to them, cannot be disputed : of 20 pupils, that were sent from Abouzabel to the hospitals of Cairo, 19 caught the disease and died. The question then comes to be, was this mortality owing to the general epidemic influence, to local atmospheric infection, or to immediate contact with the patients ? The best answer to this will probably be found by referring to what took place at Abouzabel itself—only a few miles distant, it will be remembered, from Cairo—when that place was attacked by the pestilence. The barracks of the sick were situated in the open country, at some

elevation above the plain, and well ventilated. Not one of the medical inmates or attendants, although in most frequent contact with infected persons and objects, suffered; and this too, be it remembered, in an epidemic focus. The free ventilation had prevented the formation of "a focus of infection." Dr. Laidlaw, the physician of the general European hospital at Alexandria, remarks most truly that "whenever a number of plague-patients are collected together in one space, they seem to create a pestilential atmosphere, unless free ventilation be employed." Hence the importance of never having many plague patients in one room or ward, and of maintaining a most thorough ventilation through every part of the building, which should always, if possible, be situated in an elevated open position and on a dry foundation, at a distance from stagnant water or any source of malarious exhalations. If these circumstances be not attended to, hospitals are apt to become positive foci of infection, and thus to increase rather than to diminish the general mortality.

That the disease, when it has attacked one of the inmates of a house, is, under certain circumstances, apt to extend to others who are dwelling there, cannot be disputed. Dr. Grassi tells us that, in 1835, no fewer than 57 deaths occurred in the house of Hingi Osman, the treasurer of the marine at Alexandria. This is only one out of many similar instances that might be quoted. The fair conclusion therefore seems to be, that pestilential miasms or effluvia emanate from the bodies of the sick, and that these powerfully tend to act upon the system of persons whom the epidemic influence has already made liable to the disease. Almost all the resident medical men in Egypt at the present time, who believe in the transmissibility of the plague, are of opinion that the transmission is effected in this way. Dr. Grassi is the only one who maintains that the disease is communicated by direct or indirect contact with the sick, without any intervention of atmospheric agency.

Remaining long in the chamber of the infected is the thing most to be avoided by the medical and other attendants. What Dr. Rigaud said to his friend M. Lesseps, the French Consul-general, who visited him constantly to the last moment of his life—"Do come and see me twenty times a day, but don't remain more than five minutes at a time in my room"—abundantly shews what his sentiments were upon this point.

By a singular perversion, the common practice in the East is to keep a patient in a close and confined apartment, with as imperfect a current of air through it as possible. What wonder then that a disease like plague spreads, wherever it makes its appearance: every sick chamber becomes a new focus of infection! There cannot, therefore, be a reasonable doubt that the diffusion and mortality of the pestilence are powerfully promoted by the contamination of the atmosphere with morbid emanations from the bodies of the infected.

Sometimes it happens that when a locality, which has contained a number of plague-patients, comes to be occupied by other persons (who may use nevertheless every possible precaution to avoid all contact with suspected objects), the disease re-appears to a greater extent among the new residents than can fairly be attributed to the sole agency of the epidemic influence which may be then existing.

In 1834 in the month of June, during the insurrection which broke out

in Judea, the insurgents pillaged and sacked Jerusalem. A number of Roman Catholics took refuge in the convent of St. Saviour in this city.

“ At the end of ten or twelve days of close confinement, I remarked,” says M. Delong, “ cases of plague among this distressed population, huddled together in their dormitories, upon and under the stairs, in the courts and other chambers of this vast building. After twenty-five days of expectation, Ibrahim Pacha at length arrived, and the city was relieved. The holy Fathers, full of alarm, hastened to clear their dwelling of all this mass of people, and shut themselves up in most strict quarantine. What happened? Of all those who left the convent, three only died four or five days afterwards. But, out of 63 priests who thought to save themselves by isolation, no fewer than 22 died.”

“ Now,” continues M. Delong, “ what part did infection play in this instance? I will not positively decide. It seems however clear to me, that we should, in all similar circumstances, disperse the infected into different quarters, instead of shutting them up with others, as yet intact, in a confined locality where sanitary regulations have not always been attended to.”

What occurred in the musical academy at Kanke in 1835 is still more deserving of attention :—

The plague having broken out in this school, although it was kept in the strictest quarantine, the pupils were sent into the desert, where they continued for upwards of a month. In the mean time, all the rooms were well cleansed and purified; and no person had remained in the building. Not one case of plague occurred in the desert: but no sooner had the boys returned to their old quarters, than several were taken ill; and each day several fresh cases were reported. Again were the boys sent into the desert; and again the disease ceased to spread. While they continued in the desert, 15 soldiers were employed to go daily to the village, where the plague was raging, for provisions; but none of these men caught the disease themselves, or gave it to the boys.

During this disastrous year, many striking circumstances similar to those now mentioned occurred in the military barracks, all of which had been put into strict quarantine. Although every attention was paid to cleanliness, they seemed to remain foci of infection whenever the disease had once shewn itself in them.

It will be obvious that the facts now mentioned, coupled with similar ones observed in epidemic foci and more especially on board-ship, must receive new and very useful applications in considering the question of Quarantine.

Admitting that morbidic miasms are given off from the bodies of plague-patients, and thus render the surrounding atmosphere pestiferous, we have next to enquire whether these miasms are exhaled from the lungs, or from the surface of the body of the sick, or from both; and also when they prove infectious, whether they are (most probably) absorbed by the skin, the lungs, or in the way of deglutition. There can be very little doubt in the present day that very many cases, where the disease has appeared to be the result of direct contact with a patient or with any thing he has used, may fairly be regarded as examples of infection through the medium of the atmosphere. Dr. Brayer has put this point very forcibly:

“ A person finds himself affected with plague, although he has never left the house; straightway he tries to bring the mind where he was the night before, two or three days ago, the objects he touched, and so-forth. If he has not been

out of doors for one or two weeks, owing to indisposition, it matters little ; he was out three weeks, a month ago ; and as the virus may be retained for months, nay, for years, it is not surprising that the disease should have shewn itself. He will not for a moment consider that the skin is guarded by the double covering of the epidermis and of the clothes which he wears, and that therefore the virus can only with the greatest difficulty be transmitted from the exterior to the interior. As to pulmonary absorption, that is never spoken of. It is a received opinion among the Franks that the air is not, never has been, and never can be the vehicle of the plague. They refuse to believe that, in seasons of the plague, every individual breathes an air more or less deleterious, that the person who sees or touches an invalid is in the atmosphere of the invalid, and that when, by means of the air, a deleterious principle is conveyed into the minutest bronchial ramifications, and by the act of deglutition into the gastric passages, there is then much more than mere contact ; for there is a real penetration in the first case ; and, in the second, there is digestion and interior absorption. Infection therefore exists, in the strongest sense of the term ; and the disease which it occasions is more or less severe, according to the quantity of miasmata introduced into the system, their intensity, and the individual predispositions or susceptibilities of those who have absorbed them."

The Academic Society of Marseilles, in the report which was unanimously adopted in August 1845, expressly recognises the following two propositions :—

" 1. Writers, the most at variance in all that concerns the general history of the plague, are nearly unanimous in asserting that the simple contact of one individual with another is one of the modes of transmission the least favorable to the propagation of the pestilence.

" 2. A lengthened stay in the atmosphere of the sick, and, above all, exposure to the pestilential miasms which contaminated objects exhale are highly dangerous."

The only difference, says M. Prus, which, upon this truly important point of doctrine, exists between the Academical Society of Marseilles and the Commissioners, may be thus summed up :—

The Academic Society asserts that the simple contact of individuals is one of the modes of transmission least favorable to the propagation of the plague.

The Commissioners think that no well-authenticated fact establishes the reality of such transmission. They are moreover not acquainted with any facts to authorise them to believe, with the Academical Society, in the dangers of miasms from contaminated objects.

The Academical Society and the Commissioners equally acknowledge that a lengthened stay in the atmosphere of infected persons, or, in other words, infection by pestilential miasms is that which is most to be feared.

Dr. Mead who, at the time of the plague at Marseilles in 1720, was ordered by the English government to draw up instructions for preventing, if possible, the introduction of the pestilence in England, and to arrest it if it was introduced, has much insisted upon the utility and necessity of promptly removing the sick from the seat of the infection, and transporting them to some distance.*

* R. Mead, M.D. *A short Discourse concerning Pestilential Contagion.*—London, 1720 ; and *De Peste Liber*, 1723.

He has mentioned as worthy of imitation the course pursued at Rome, during the plague of 1657, by Cardinal Gastaldy, at that time invested with full power to take every sanitary measure which he judged proper.

The Cardinal prohibited any infected person, and even any person in health who was suspected, to remain in their houses. They were promptly taken to the hospital, built on the island which divides the Tiber. With respect to those who had occupied the same house, they were placed in other hospitals near the city, from whence they were removed into the island if the disease shewed itself. During this time, the Cardinal was very careful to have all the furniture taken out of the infected houses, exposed in the open air, and the apartments left open, in order to purify them.

By these means the Cardinal, in two months, caused the plague to cease, after it had raged at Rome for two years.

But that which deserves most attention, adds Dr. Mead, is, that, before these regulations, it was constantly observed that the disease rarely appeared in a house without attacking all its inhabitants; whereas, after they had been put in force, scarcely five out of a hundred of those who were removed from the proximity of the infected, were subsequently attacked with plague.*

Muratori informs us that similar measures had been adopted with equal success at Ferrara, in 1630.†

The Board of Health at Constantinople has, for the last eight or nine years, followed out the prophylactic method recommended by Gastaldy and Mead, removing the infected to a hospital, and emptying every house, in which a case occurs, alike of its inhabitants and furniture, having it well cleansed and purified, and not allowing any one to occupy it for the space of a month. It is to the adoption of these means that the Board attributes the exemption of Constantinople and the principal ports in Turkey from the plague, since the year 1839.‡ If, in place of acting in this manner, the houses of the infected were condemned with their inmates to a severe quarantine, the result would necessarily be to create fresh foci of pestilential infection, and thus increase the very evil that is vainly sought to be extinguished.

M. Seisson, principal physician to the hospital at Cairo and formerly professor of the School of Medicine at Abouzabel, observes that if, at the time of the appearance of the plague at Cairo, in 1835, after the arrival of the Maltese Giglio, who died of that disease which he had brought from Alexandria, they had dispersed the other members of his family in the country, it would probably have prevented the death of eight or ten persons who, kept by military force within the house, contracted the plague and died. Two persons fled from the focus of infection, of which the quarantine was the cause; they both remained free.

The case of Giglio, adds M. Seisson, does not prove, as it has been said, the contagion of the plague; it only proves the danger of shutting up, in a narrow space, individuals who have been in connection with an infected

* Gastaldy, *Tractatus de avertendâ et profligandâ peste*. Bologna, 1684, folio.

† Muratori, *Governo della peste et delle maniere di guardasena*. Modena, 1714, 8vo.

‡ The correctness of this conclusion has been questioned by not a few experienced observers.—G. M.

person. It is therefore of the first importance to abolish what are called special quarantines for houses, in which persons have been seized with plague. On the contrary, they should be at once emptied, aired, and purified, to prevent every focus of infection.*

Dr. Mead has quoted from Gassendi a passage, wherein this author attributes the frightful mortality of the pestilence that prevailed at Digne in Provence, in 1629, to the severe measures that were taken to prevent the inhabitants from leaving the town and retiring into the neighbouring country.

In 1720 the inhabitants of Marseilles were prohibited, under pain of death, from leaving that city or its suburbs! Hence, doubtless the terrible devastation that ensued.

“And yet,” says M. Prus, with an emphatic force of argument that cannot fail to make a deep impression on the public mind, “what would be done in the present day according to existing regulations, if the plague made its appearance in any town of France? It would be isolated by a cordon of troops, for the purpose of preventing any of the inhabitants leaving it; in other words, the unfortunate town would be condemned to retain, and in a concentrated form too, within its bosom all the various causes which serve to develop foci of pestilential infection. Is it then impossible to reconcile the advantages of the public health with the most common laws of humanity? We think not; on the contrary, we are firmly convinced that perfect security may be given to neighbouring towns and to the whole kingdom, by taking the necessary measures to remove the great majority of the inhabitants of the town, in which the plague should appear, from the danger. To obtain results so desirable, it needs only to know how to profit by all that time and experience have taught us of the epidemicity of the disease and of pestilential infection.”

Conclusion.—“In epidemic foci, the plague is transmissible by the miasms which emanate from the bodies of the infected, and by the foci of infection thereby produced.”

CHAP. VI.—*Is the plague transmissible beyond, or away from, epidemic foci?*

This, it will be perceived, is the most important of all the questions respecting the history of the plague, in reference at least to the subject of Quarantines; for, upon its solution, the propriety of making any change in existing regulations must depend.

A considerable number of medical men, who have studied the epidemics of 1835 and 1841 in Egypt, answer it in the decided negative, and for the following reasons:

When the epidemic constitution ceases, all or nearly all the sick recover, and no new attacks occur.

Numerous plague-patients have been, and still are, accumulated in the hospitals and houses; all the conditions favorable to the transmission of the plague by mediate or immediate contact, or to its propagation by miasmatic infection, continue to exist together; and yet, at a period that is almost known and determinate, the epidemic becomes extinguished, and with it the plague ceases entirely.

* M. Seisson. *Lettre adressée au consul-general d'Angleterre à Alexandrie en 1839**

An infected person coming from an epidemic focus is now not more to be feared than a sporadic plague-patient, who, by the consent of all the medical men in Egypt, never occasions any risk.

If it is doubtful whether the clothes and goods of infected persons can transmit the plague in the time of an epidemic, it is certain that, when once this has disappeared, such clothes and goods may be used with impunity.

An epidemic only appears in a country in the train of certain local and atmospheric influences, whose action has been prolonged for a greater or lesser period of time; very commonly too, privations, fatigues, physical or moral troubles have been experienced, in different degrees, by the inhabitants. From these united causes result more or less general predispositions to contract the prevailing disease. Now, when a vessel carries one or more infected persons beyond the focus of infection, she cannot take along with them all the causes, past and present, which are necessary to the development of an epidemic.

It must be confessed that the observations, made in Egypt during the years 1835 and 1841, seem to justify these propositions and the conclusions which flow from them.

Let us now see whether the facts observed on board vessels at sea, and in the Lazarettos of Europe, are in accordance with these conclusions.

Since the year 1720 down to the present period, 25 vessels having the plague on board, have arrived in the ports of France or Italy; 10 at Marseilles, 5 at Venice, 8 at Leghorn, and one at Genoa. We shall confine our remarks to the circumstances connected with the arrivals at Marseilles, the official documentary evidence upon these being much more complete than in the other cases. The years in which these arrivals occurred in 1741, 1760, 1784, 1785, 1786 (*bis*), 1796, 1819, 1825, and 1837. The entire number of cases of plague (omitting all the doubtful ones), treated in the lazaretto of this port since 1720, is 32; and of these, 18 have proved fatal. Three of the quarantine surgeons caught the disease during their attendance on the infected; they all recovered. A fourth surgeon, who had arrived on board an infected ship, and subsequently acted in his professional capacity in the lazaretto, died. Four of the health-guards, who had been (most improperly) put on board infected ships, contracted the disease in the lazaretto; two died. A sailor, who acted as assistant in the lazaretto infirmary, was taken ill and died. Two other sailors, belonging to an infected vessel, but who seemed to have caught the disease in the lazaretto where they had been confined for more than 12 days, died.

In the 11 cases therefore of plague, which might have been contracted in the lazaretto, 6 of the patients recovered, and 5 died: all the latter cases occurred in men who had been on board infected vessels. Of the three health-guards, who had caught the disease on board, only one recovered. Indeed it would seem that, in all the fatal cases, the patients had been for a longer or shorter period of time on board infected vessels.

It appears, also, that not one of the cases, which occurred on board a vessel at sea during the voyage to France, recovered;—a circumstance that very emphatically shews the malignancy of the disease when it occurs in a crowded confined space, and the great advantages of treating it in a large open lazaretto.

From the facts now alluded to, we are surely justified in maintaining not only that the plague may be transmitted on board-ship among individuals coming from the same infected focus, and living in the same hygienic conditions; but also that a plague-patient, received into a lazaretto in another and distant country, may become the cause of infection to others. The *conclusion*, therefore, of the Commissioners is this :

“ It is indisputable that the plague is transmissible beyond or away from epidemic foci, whether on board vessels at sea, or in the lazarettos of Europe.”

The question proposed in Chap. VII. is to this effect: *Is the plague transmissible, away from epidemic foci, by immediate contact with the infected?* It is at once answered in the negative; there is not a single authentic case on record to prove that the disease has ever been propagated in the way mentioned. The same thing may be said in answer to the question in the following Chapter, viz: *Is the plague transmissible, away from epidemic foci, by the clothes or other effects which have been used by the infected?* Instances indeed have been related, by some writers, of passengers appearing to be taken suddenly ill almost immediately after opening their bags or boxes, and handling their contents; but not one of the narratives of this sort is satisfactory in its details or conclusive in its evidence. Nevertheless the Commissioners, unwilling to commit themselves unqualifiedly on the point under consideration, suggest that new experiments and observations should be made with all possible precautions, at a distance from every focus of infection, and in a locality where the plague is not endemic.

CHAP. IX.—*Can articles of merchandize transport the plague beyond or away from epidemic foci?*

The evidence and facts, on which the advocates (few in number as they are in the present day) of the affirmative side of this question chiefly rest their opinion, are the following :

The plague of London in 1665 is said by Hodges to have been imported from Holland into England in bales of cotton. But it may be fairly objected to this opinion, that the registers of that city clearly shew that the disease had been endemic within its walls for some years preceding the outbreak of the great pestilence, and the destructive conflagration that occurred immediately afterwards. Since that period, the plague has never reappeared in the English metropolis.

The testimony, that has been adduced to shew that the plague of Toulon in 1721 was owing to the reception by some of the inhabitants of some suspected silk that was stolen out of quarantine, is equally unsatisfactory. These and such-like statements cannot be fairly admitted, in the present day, to be entitled to much weight in the determination of the important question under enquiry. We are not sufficiently acquainted with the accompanying circumstances of either case to warrant us in laying much stress upon them. Does the following fact,—the details of which may be relied on as in every respect authentic and perfectly accurate—communicated by Dr. Laidlaw to the English Consul at Cairo, enable us to form any thing like a decided opinion?

In 1835, the epidemic plague raged at Alexandria among all the servants and employés living in the magazines of the Egyptian government.

Notwithstanding this, a vast number of bales of cotton, daily handled by the prisoners, were exported from January to June—that is to say during the whole continuance of the epidemic—to all the great ports of Europe.

There were exported this year

To England	.	.	.	31,709 bales.
To Marseilles	.	.	.	33,812 „
To Leghorn	.	.	.	424 „
To Holland	.	.	.	150 „
To Trieste	.	.	.	32,263 „
To other ports	.	.	.	32 „

Now, although no precautionary means were taken in the way of disinfecting this immense quantity of an article that has always been deemed highly susceptible of retaining the infectious effluvia, not one person seems to have been infected in consequence.

Of sixteen English vessels laden with cotton, which sailed from Alexandria from the beginning of January to the end of June, eight had the plague on board; and yet their cargoes did not prove more dangerous than those of the non-infected vessels.

Besides this very conclusive evidence, the Commissioners mention upon official authority that, since the year 1720, not one of the porters employed at the lazaretto of Marseilles in discharging and landing the cargoes of suspected ships has ever caught the plague.

The *conclusion* is therefore fairly forced upon us that

“There is nothing to prove that articles of merchandize can transport the disease beyond epidemic foci.”

The division of objects of merchandize in the French lazarettos into three classes, according as they are (believed to be) susceptible, doubtfully susceptible, and non-susceptible of infection, is the most arbitrary and ridiculous thing imaginable; nor is it easy even to form a conjecture what possibly could have led any set of reasonable men to adopt it. Tallow and wax, for example, are declared to be non-susceptible objects; but when made into candles (from the wicks, we suppose), they are susceptible! Pieces of old copper and other metals are conductors of the pestiferous poison; wood and other porous substances are not! Truly, as M. Prus remarks, the classification can only be regarded “as the result of most imperfect observation and of antiquated traditions prompted by fear and prejudice.” It is utterly discreditable for any enlightened government to retain and act upon it.

The great point is to determine whether the clothing and baggage of plague-patients are capable of communicating the disease in our ports. If the decision upon this subject be in the affirmative, then certainly it will be right to ascertain what other objects possess the same property; but should it be in the negative, it is scarcely necessary to say that the entire catalogue of interdicted articles must be swept away.

It is quite unnecessary, as a matter of course, to say a single word respecting the comparative value of different modes of disinfection that have been proposed at different times. Most of the substances used in fumigation are utterly worthless; some of them are dangerous, and therefore inexpedient. Chlorine and its preparations are unquestionably the safest and best.

Conclusion.—"The study of the means best fitted to disinfect baggage, clothes, and articles of merchandize, remain still to be made.

"To be rational, before researches on this subject are undertaken, it should be proved that these different objects are really capable of becoming charged with the principle of the plague."

CHAP. X.—*Can the plague be transmitted by pestilential miasms, beyond or away from epidemic foci?*

When, on board-ship or in a lazaretto, the plague is communicated from an infected person to one in health, it is obvious that it must be always difficult, and often impossible, to say positively that the disease has been owing to direct contact with the sick; for, whoever has been so near a patient as to have touched his body, must have inspired the pestilential atmosphere that is around him. How, then, shall we decide whether the infection has taken place by the skin or by the lungs? The task is indeed not easy, if indeed it be possible. But if we consider, on the one hand, that numerous observations have clearly shewn that immediate contact with plague-patients have not given the disease, and, on the other hand, that residence in a focus of pestilential infection, but without any contact with the sick, has imparted it, we are surely almost compelled to admit the following *conclusions*, viz.

"1. The transmission of the plague by pestilential miasms is a proved fact.

"2. The transmission of the disease by immediate contact with the infected is not a proved fact."

It has been already seen, from the experience of the Marseilles lazaretto, that, whenever there was plague existing in a ship, the stay of the vessel in the port became dangerous not only for the crew and passengers, but also for the health-officers who were sent on board, and who, it will readily be believed, most carefully avoided all contact with the sick or with any suspected object. Too often, the vessel becomes a genuine "focus of pestilential infection." The air, loaded with the miasms that always emanate from the bodies of the sick, acts as a poison to all who inhale it. This infected state of atmosphere on board a vessel may continue for some time, after every plague-patient has been removed from on board. We are therefore fairly warranted in concluding that "the plague is transmissible by infection (in other words, by the atmosphere being charged with pestilential miasms from the bodies of the sick) beyond or away from epidemic foci, as we have already seen that it is so in epidemic foci, and in countries where the disease is endemic."

To this general conclusion it may be useful to append the following three, which are but as corollaries from it, as upon each of them certain quarantine measures are based.

"1. It follows from the facts adduced in the preceding chapters relative to the transmissibility of the plague, alike within and at a distance from epidemic foci, that plague-patients, by vitiating the air of places wherein they are confined, may create foci of pestilential infection that are capable of transmitting the disease.

"2. Foci of pestilential infection may persist in a place after the removal of plague-patients from it.

"3. Foci of pestilential infection once formed in a vessel, by the presence of one or more plague-patients on board, may be transported to great distances."

CHAP. XI.—*Is sporadic plague transmissible either by the infected themselves, or by foci of infection which they may form?*

This question has already received a partial answer; but it will be useful to recur to its consideration in this place. The grounds, upon which almost all the medical men in Egypt have adopted a negative opinion on the matter, are as follow.

After the epidemic of 1835 had ceased, the attention of these gentlemen—divided, be it remembered, in opinion as to the general question of the transmissibility of the plague—was naturally directed to the sporadic cases which occurred in the latter half of that year, and also in 1836, 37, and 38. From June 1835 to the end of December 1838, 649 cases of sporadic plague were observed in Alexandria. Now it is admitted by all that, of these 649 cases, 646 did *not* transmit the disease to any of the persons who had waited upon, and had frequently touched, the sick. It is therefore in reference to the three remaining cases only that any difference of opinion has existed; and with respect to these three cases, we think that no unprejudiced reader will hesitate to say, after carefully perusing the reports, that they are very far from proving that the disease was communicated, in a single instance, from one patient to another.

Here it deserves enquiry whether the cases of plague that have at any time been imported into Europe have, or have not, been brought by vessels which had left the producing countries of the disease, while a pestilential *epidemic* was prevailing. The imported cases of the plague have never, we believe, been sufficiently considered in this point of view, although it bears very obviously on the question of the transmissibility of *sporadic* plague. The examination of the histories of the ten importations of the plague into Marseilles since 1720 has led the reporter to believe that, in every one of these instances, the pestilence was raging epidemically in the ports whence the vessels had come. This interesting fact certainly does not prove that sporadic plague is not transmissible; it only shows that none of the numerous vessels, which have left Egypt, Syria, or Turkey since the year 1720, at a time when these countries suffered only from sporadic plague, has ever imported the pestilence into Marseilles. This consideration, coupled with the remark of intelligent and trustworthy observers in Egypt that the cases of sporadic plague, which have occurred from July 1835 to the beginning of 1839, have in no instance transmitted the disease, deserves the serious attention of all medical men and legislators. M. Brayer also has come to the same opinion respecting the sporadic plague at Constantinople.

Conclusion.—"Patients affected with sporadic plague do not seem to be capable of producing foci of infection sufficiently active to transmit the disease."*

CHAP. XII.—*Is the plague more or less readily transmissible according to the intensity of the epidemic, the different periods of its course, and the or-*

* In a subsequent part of the Report however, when treating of quarantine restrictions, it is rather strangely stated that "the non-transmissibility of sporadic plague is not yet sufficiently determined by experience to warrant us in founding a sanitary measure upon it."

ganic susceptibilities of the individuals exposed to the action of pestilential miasms?

There cannot be a doubt for a moment that different epidemics, of this as well as of other pestilences, exhibit very different degrees of intensity or malignancy, as evidenced by the varying amount of mortality produced in different seasons. Now, a question here arises, whether the risk of infection is at all proportionate to the degree of this malignancy. It will be obvious that it is scarcely possible to determine this point within the range of the general exciting causes of the pestilence, or, in other words, within the circuit of the epidemic focus. The observations, to be at all satisfactory, must be made on cases occurring beyond, or at a distance from, such a focus; for there, the miasms exhaled from the bodies of the sick will operate alone. The results of past experience seem unquestionably to indicate that the liability of such cases to propagate themselves is in direct relation with the intensity of the epidemic, at its place of origin. The greater this intensity, the more readily the disease is communicable; and the reverse holds true, in proportion as this intensity diminishes. When the plague ceases to be epidemic, its transmissibility appears to cease altogether.

The period, too, of the epidemic has a decided influence on the force of the transmissibility of the disease. We have already considered this point, and need not dwell upon it here.

What has been said respecting the period of the epidemic in this point of view, is equally true of the period of the disease. Larrey was of opinion that the plague was not communicable during its first period or stage. Dr. Lacheze maintains that the disease ceases to be so after the second stage; that is, after the fourth or fifth day from its invasion. In the case of the disease, as in that of the epidemic, it is the second period which is most dangerous. Moreover, the influence of the organic dispositions or susceptibilities of individuals, in other words of their general state of health and their idiosyncrasies, either in promoting or in counteracting the liability to infection, cannot be disputed by any one. Much unquestionably depends upon the hygienic regime that is followed. Whatever tends to enfeeble or deprave the powers of life, renders the system more liable to infection. Hence excessive fatigues, the want of proper nourishment and the abuse of spirituous liquors on the one hand, and luxurious dissipation and excessive venery on the other, are all powerfully predisposing causes. Larrey observed that any tendency to the scorbutic diathesis rendered the system unusually susceptible, and that all such cases proved very rapidly fatal. We have already seen that race, nationality, sex, age, the circumstance of being acclimated or not, &c. have all some influence in aiding, or otherwise, the tendency to be affected by general epidemic causes. The same is the case with respect to the action of pestilential miasms.

CHAP. XIII.—*Is there reason to believe that the plague, when imported from the East into any European port, may be communicated to a sufficiently large number of persons to give rise to a pestilential epidemic?*

The medical men of Egypt answer this query in the negative. Their opinion is based on the often observed fact that, when plague-patients are transported to places not subject to the pestilential constitution, they

die or recover without transmitting their disease to any one. If the infected, as we have seen, cannot communicate the disease to the inhabitants of certain places in Upper Egypt, how shall we believe that, when transported from Egypt to France, it will possess a power of transmission so strong as to occasion an epidemic?

Some observers—and Dr. Lacheze is of this number—have indeed remarked that, in certain cases and in certain localities not subjected to a pestilential constitution, the disease has been communicated to a few individuals; but that these latter in no instance transmitted it to any one, notwithstanding the most free and intimate intercourse. Dr. Lacheze does not admit that the plague can ever, without a pre-existing epidemic influence, attack a sufficiently large number of persons to constitute a public calamity; and he insists that, wherever it has committed great ravages, there has uniformly been a pestilential constitution prevailing at the time. Sydenham, too, was of this opinion; for we find it distinctly asserted in his writings that, however frequent the importation of the plague might be into England, the disease would assume an epidemic character only every thirtieth or fortieth year; because, then only, would it find the atmospheric conditions and the organic predispositions that are favorable to its development and propagation.

This doctrine is very generally received in Egypt in the present day, and its truth has already been recognised by many of the most intelligent physicians in Europe. The legitimate inference from its public recognition would be that vessels arriving from infected ports, and having the plague on board, might be permitted to land the sick at any place not subject to the epidemic pestilential influence, without any risk to the people of that place, whether the patients recovered or not. But then it must be remembered that, until we are better acquainted than we are yet with what are the conditions of the soil and the atmosphere which, in Europe, may give rise to a pestilential constitution, and what is the meteorological condition in which an imported plague may be liable to become diffused, prudence will authoritatively require that the very same measures should be taken in the ports of France against the possibility of the propagation of the pestilence by the infected, as if there was no room for doubt that they may become the cause and starting-point of a pestilential epidemic.* This caution is more particularly necessary in the case of Marseilles than of any other place in France, in consequence of its many local sources of insalubrity.

This great sea-port presents—in the circumstances of its climate, of its harbour being choked with filth of all sorts and containing an admixture of salt and fresh water, of its large working population, of its being hemmed in on all sides by mountains which prevent the free circulation of the air, and lastly of its proximity to large ponds—the very conditions that are favourable to the development of the plague.† It is a remarkable thing

* This is one of the conclusions of M. Prus, the justice of which has very fairly been impugned.—G. M.

† *La topographie médicale de Marseille, par M. Ducros, médecin en chef de l'Hôtel Dieu de Marseille, 1837.*

that the two cities of Europe which, after Constantinople, have suffered most from this pestilence are Venice and Marseilles :—Venice, which by its lagunes, its filthy canals, the moist heat of its climate, and by the wretched state of a large portion of its inhabitants, combines most of the causes which engender spontaneous plague, and may therefore, *a fortiori*, promote the diffusion of the disease when imported; and Marseilles, which in this respect approaches far too near to Venice.

Here we must not fail to remark that sufficient attention has not hitherto been paid to the cases, certainly very numerous, where the plague conveyed to a country has become spontaneously extinguished, for very want of being able to transmit itself. It would be very useful to ascertain with precision what are the local causes, which appear to resist the transmission and propagation of the disease. This work has only just been commenced in respect of a few places in Upper Egypt.

Conclusion.—“ If it has been proved that the existence of a pestilential constitution in a country, into which the plague is imported, is necessary for the transmission and propagation of the disease, it seems nevertheless certain that imported plague will not exercise any great ravages, if it does not meet with, in the character of the climate, atmosphere and population of the place, the conditions that are favourable for its development.”

FOURTH PART.

What is the ordinary or exceptional term of the incubation of the plague?—in other words, how long may the plague remain hidden, so to speak, in the system of an infected individual, before it manifests itself by more or less distinct symptoms?

This period is believed to vary considerably according to the stage of the prevailing epidemic, and other less influential circumstances. The variations are nevertheless confined within certain limits, which it is important to ascertain; for upon them should depend, in a great measure, the duration of quarantines.

All observers have remarked that, when a pestilential epidemic commences in a town, the incubation of the disease is often extremely short. We read of attacks of the plague proving fatal within a few hours, nay within a few minutes: these are the cases, which have been aptly called “*pestes foudroyantes*.”

In the second period or stage of the epidemic, the usual term of incubation is from three to five days. It is about the same in the third stage.

Upon all these points there is little or no discrepancy of opinion. It is only when we endeavour to determine the longest duration or lapse of time that may be fairly admitted for certain exceptional cases, that we find the statements of different writers to disagree. Some, and these constitute the large majority, maintain that the term of incubation never exceeds eight days; others think that this term may be prolonged to ten days, and sometimes, although very rarely, a few days more. Dr. Grassi, in his reply to certain interrogatories addressed to him in 1839 by the English minister, says upon this subject:

“ In the course of several years, some thousands of persons of every age,

sex and condition, were condemned to undergo a quarantine of observation of six days for having been exposed to infection. The disease made its appearance in many of them during their isolation, but in no one case beyond the sixth day. This is an observation which I have made with great attention."

On his representations to the Egyptian government, the quarantine, which had before been eleven days in the lazaretto at Alexandria, was reduced in 1842 to seven days.

The experience of other medical men in Egypt has, on the whole, confirmed the truth of M. Grassi's observations.

This gentleman assures us that, among the multitude of people that left Cairo during the epidemic of 1835 and fled into Upper Egypt, which continued healthy, the disease manifested itself in a few persons; but, in no one instance, more than the eight days after their quitting the city.

The observations made, in the course of the same year, by the professors of the medical school at Abouzabel lead to the general conclusion, that the period of incubation never exceeds six days. According to M. Segur, it is never more than eight. If, too, we examine what has occurred in vessels that have had plague on board after leaving an infected port, we shall find that on every occasion the disease has shown itself within eight days from the time of sailing.

With respect to those cases where it has been alleged that the period of incubation exceeded eight or ten days, M. Prus does not consider them at all worthy of acceptance, in the sense in which they have been adduced; for no account has been taken by their narrators either of the epidemic influence, or of the miasmatic infection which always acts an important part in places that are badly ventilated; in a ship for example. When a vessel becomes a focus of infection in consequence of having had a number of plague-patients on board, the persons, who remain in this focus and breathe the vitiated air, may, and often do, contract the disease at intervals of a longer or shorter space of time. It is obvious that, under such circumstances, the sailors and passengers may be seized 15, 20, 30 days and even upwards, the one from the other, without the inference being at all warranted that the Incubation of the malady has existed in any one case for more than six or eight days. We, in truth, cannot make out when the pestilential miasms began to act on those who had received them into their systems, in such a manner as to occasion the development of the disease.

Conclusion.—"If it be true that a fixed and absolute term cannot be assigned to the incubation of the plague, it seems, nevertheless, to be clearly proved by well-established facts that, at a distance from countries where it is endemic and beyond or away from epidemic foci, the disease has never broke out in persons who have been exposed to its influence after an isolation of eight days. The few facts, which might be regarded as exceptional to this rule, are all susceptible of another interpretation."

The concluding part of the Report is occupied with an account of the Quarantine regulations now in force in the different ports of France on vessels arriving from suspected countries, and of the changes which the Commissioners propose should be adopted. We have no intention to allude to the first of these matters; and, with respect to the second, our remarks shall be very brief.

It is suggested, and the suggestion is certainly a valuable one, that medical men should be appointed by Government to reside in the different places where the plague is most apt to exist, in order that regular reports as to their sanitary condition might be transmitted home, and for the purpose of officially examining the state of every vessel, with respect to her passengers, crew, cargo, accommodations, &c., about to leave the country for any French port. The resident consular agents would then be better qualified, by the accurate professional details thus acquired, to determine when to grant and when to refuse clean bills of health to the vessels of their own nations. The affixing of the medical certificate to the ship's bill of health would also enable the officers of the port, where the vessel arrived, to judge more correctly of all the circumstances connected with her past and present condition. The Commissioners propose that no clean bill of health should be granted when a pestilential epidemic prevails or appears to be impending in the place of departure, or even when the number of sporadic cases of the plague are so numerous and severe as to occasion apprehensions that the malady may spread. In all other cases, a clean bill might be granted at the port of departure.

Although believing that the clothes and other effects of the sick are not capable of transmitting the plague, the Commissioners suggest that, until further experiments are made upon this subject, all those articles should be duly ventilated during the voyage; or, what would be better, that the trunks and boxes of the passengers and crew should be secured and stamped (*plombées*) at the port of departure, and not be opened until this can be done in a French lazaretto, where they should be well ventilated for three days or so.

The following are the suggestions of the Commissioners in respect of the Quarantines which they deem advisable, in lieu of those now existing in French ports.

1. For vessels having a medical man on board, and coming from Egypt, Syria, or Turkey with a clean bill of health, the quarantine to be 10 full days, *to date from their departure*, provided no case of plague or of any suspicious disease has appeared during the voyage.

The quarantine to be 15 full days, *to date from their departure*, for the same vessels arriving with a foul bill of health, if neither plague nor any suspicious disease has occurred on board during the voyage.

2. For merchant vessels arriving with a clean bill of health, but having no medical man on board, a quarantine of observation to be for ten full days, *to date from their arrival*.

When the same vessels shall arrive in a port with a foul bill of health, but without having had either plague or any suspicious disease on board while at sea, a most strict quarantine to be for 15 days, *to date from their arrival*.

If a case of plague, or of suspicious disease has occurred on board during the voyage, or should occur after the arrival of the vessel in a French port, the vessel to be subjected to a rigid quarantine, the length of which to be determined by the sanitary authorities of the port. The passengers and crew to be transferred to the lazaretto, and detained for 15 days at least, and 20 at most; the cargo to be unloaded and freely exposed to the air; the vessel herself to be well cleansed out, purified, and left

empty for a month at least; and health-guards to be stationed near to, but not to be put on board of, the infected vessel.

With respect to the cargo, since it has not been proved by any authentic fact that articles of merchandize have the property of retaining pestilential miasms, and of transmitting the plague, the Commissioners confine themselves to merely recommending the employment of such means as are most simple and least oppressive or vexatious to commerce.

After exposing the barbarous absurdity of the plan followed at the Marseilles lazaretto, even up to the present day, in the treatment of any one affected with, or supposed to be affected with, plague, it is suggested not only that plague-patients should be treated and waited upon like any other patients, without using the cruel and ridiculous precautions that are still in force, but also that *post-mortem* examinations should be made in all fatal cases.

Should the plague break out in any house, town, or district, the rules to be followed are simple and obvious. The sick should be immediately removed from the dwelling, where the disease has appeared, to a healthy well-aired spot that has been fixed upon; while all the other inmates also should be compelled to leave it, in order that it may be duly cleansed, purified, and ventilated. On no pretext, should the infected be confined and inclosed along with the healthy by sanitary cordons, or other compulsory measures, in the very place where the pestilence exists; this were only aggravating the mischief and rendering it more concentrated. The great object should be to attenuate the virulence of the atmospheric poison by separating the sick from the healthy, and by keeping both in airy, elevated, situations. If necessary, tents and simple barracks should be established, and the healthy be compelled to dwell in them, at a distance from the focus of infection.

The Report, of which we have now given so extended an analysis, was elaborately discussed at eight or nine sittings of the Academy of Medicine, in the months of May, June, July and August. Notwithstanding the labour expended, we do not think that either much new matter was added to the details which the Report itself contains, or that any of its more important positions were successfully impugned. The majority of the speakers, as well as of the members of the Commission, declared their cordial concurrence with the results of M. Prus' researches, while the minority were divided into two sections that maintained very opposite opinions; the one advocating nearly all the extravagant notions held by the ultra-contagionist party, and the other loudly proclaiming the non-communicability of the plague under almost any circumstances, and calling for the entire abrogation of all quarantines. The reader will be able to judge for himself of the value of the opinions of both of these parties.

By far the most valid objection to the Report is, that the practical recommendations, proposed in its concluding portion, are not altogether consistent with the doctrines professed before; the quarantines recommended are unnecessarily stringent and severe, if the conclusions in the body of the Report be correct.

On the whole, however, the labours of the French Commissioners are deserving of the very highest praise; and we should be doing injustice to our own feelings if we did not again express our grateful admiration of

M. Prus' industry, good faith, and sound discriminating judgment in the execution of his arduous and responsible task.

We now proceed to notice the result of the steps which the British Government took, in the course of the year 1844, to collect authentic information upon the questions which Prince Metternich considered to require solution, before the meeting of the delegates from different European powers could advantageously take place. It would, indeed, have been gratifying to our professional, as well as our national, pride, if we could have pointed to a work commensurate, in point of merit and importance, with the Report which has been submitted to the attention of our readers. But there is no Royal Academy of Medicine in this country, to which our Government can apply upon such great questions as that under consideration. Would that there was! For assuredly the unconnected enquiries of different individuals, although aided with all the advantages of official privilege, are not likely ever to have that completeness of detail and general comprehensiveness of character which we look for in the well-considered report of a competent public body.

In October, 1844, Sir William Pym was dispatched to visit all the ports in the Mediterranean, where lazarettos and quarantine establishments exist, and to obtain information upon every subject connected with them.

After describing the various places which he visited, and briefly mentioning the quarantine regulations that exist in each, Sir William makes the general remark that "the periods of Quarantine both as to the persons and merchandize may be very considerably reduced, particularly with reference to vessels arriving from places with clean bills of health, and in some instances altogether abolished, such as upon vessels from the Black Sea and those crossing the Atlantic; and that many of the unnecessary, vexatious, and expensive regulations, more particularly in the Italian States, may be discontinued."

As a matter of course, Sir William takes it for granted that the plague is contagious (communicable by contact, we presume), and that the contagion may be transmitted not only by the sick themselves but by various *fomites*; for we read that "it will be necessary to decide upon a list of articles of merchandize that are supposed to require purification, under the impression that they have been contaminated by persons having the plague, and the period of time required for their purification, together with the best means of doing so. To effect this, it may be necessary to examine practical men from different lazaret establishments, the superintendants of quarantine, captains of lazarets, and the medical men attached to these establishments." Some of these parties here named are not, we fear, the most likely to come to very sober decisions upon the points under consideration; they are contagionists *par metier*.

The date of Sir Wm's letter, from which these extracts are taken, is June 1845. His next letter, dated September of the same year, is occupied with answers to the three questions or points of enquiry mentioned by Prince Metternich in his reply to Lord Aberdeen's invitation. To the *first* on the list—as to the minimum and maximum of the terms of quarantine necessary for persons—Sir W. gives the following reply:—

"It appears to me that this question, and the one of greatest importance in this enquiry (the incubation of plague in the human system), was decided by the

almost unanimous opinion of eighteen medical men in the Levant, by their replies to queries as published in the Parliamentary Papers; all of them, however much they differed in opinion upon the subject of contagion, agreed upon the short period of incubation, viz. from three to ten days, with one exception, Dr. Floquin, of Smyrna, who put down fifteen days as the maximum; and the opinion of those medical men is confirmed by the inclosed valuable document. No. 1, being a return of 5240 individuals who had undergone the *spoglio* in the lazaret of Alexandria in the course of four years, out of which number forty-three were attacked with plague, and all of them before the eighth day after the operation of *spoglio*."

The answer to the *second* question contains an admission that is so truly important, in a commercial as well as in a medical point of view, that we request our reader's special attention to it :

" It is difficult to obtain any decided evidence upon this question, as during my Quarantine mission *I could not ascertain that any one case of plague had been produced in any one of the various lazarets that I visited, in consequence of the manipulation of merchandize*;* and as in the principal lazarets in the Mediterranean (Marseilles and Malta) they have gradually abolished the *serenos* (probationary airings), and reduced the period of depuration of goods with foul bills to twenty-one days, it does not appear that this period could be further reduced with such cargoes as cotton, if exposure to the atmosphere is to be considered necessary; as it will take the full time, according to the present practice of opening first one side of the bale for a certain period, then making up that side and opening the other for the same time, making in fact the quarantine upon cotton only ten days, which last period will be sufficient for small cargoes or parcels of merchandize, which can be at once opened and exposed to the air."

On the *third* point—as to the best means of disinfecting objects susceptible of contagion—Sir W. very naively remarks; "from what I have stated as to the non-appearance of plague in any one instance from the manipulation of merchandize in Lazarets, the present practice of exposing goods to the atmosphere for a certain period, appears to have been attended with success." He seems never to have even so much as dreamed of the possibility that the goods possessed no contagious property whatsoever; and yet, strange to say, he was aware, all the while, that not a single instance could be produced of the plague having been ever communicated by the manipulation of merchandize, in the lazarets which he visited! Such are the blinding effects of old deep-rooted prepossessions on the mental vision even of the most experienced observers.

The following brief notice of the vessels which have arrived at Malta with the plague on board, and have been duly depurated in the lazaretto there, since the island has been in possession of Great Britain (not including the plague of 1813), will be found to contain some interesting particulars, serving to illustrate and confirm several of the most important positions in the French Report. The details—derived from the Parliamentary Correspondence, published this year—will not be deemed tedious or unneces-

* Mr. Turnbull, our consul at Marseilles, states that though the coast of France there is peculiarly liable to contagion, supposing contagion to exist, and though vessels are almost daily arriving from plague countries, there has been no instance of any expurgator having taken the plague since 1720.

sary by any who wish to understand thoroughly the important subject under consideration.

1819.—A Maltese vessel, laden with oil and soap, arrived on the 27th of March from Susa, from which she had sailed on the 20th with a foul bill, in consequence of the plague prevailing there; from 15 to 18 persons were dying daily. The day before sailing, one of the crew had been taken with symptoms of fever. On the 21st, vomiting with delirium set in, and next day he died. The master stated that there were no external marks of plague during life, but that several petechiæ were observed on the belly and thighs after death. Four of the remaining five persons of the crew were attacked with the plague, while in the lazaretto; one on the 3rd, and three on the 4th of April. Of these four cases, two proved fatal. *The health-guard, and two persons (all from pratique) who nursed the sick, were not attacked.*

1821.—A Maltese brig, laden with beans, arrived on the 21st of March from Alexandria, with a foul bill, having 14 of a crew and 8 passengers on board; two of the passengers and one of the crew had died during the voyage. On the 27th February, the day before sailing from Alexandria, ten passengers were received on board. Of these, eight were in good health; but two, a woman and her daughter, were sickly, having been suffering from diarrhœa. Both died, the mother on the 2nd March, and the daughter on the 16th; no marks of plague were observed, it was said, on examination of the bodies. Besides these cases, one of the crew, who had suffered much from sea-sickness and had taken no food, became feverish and delirious on the 17th; then profuse diarrhœa came on, and he died about midnight. Several petechiæ were observed upon the body. While in the lazaret, no fewer than ten of the crew and four of the passengers were taken ill; of these 14 cases, 12 proved fatal.

On the 28th of March, a health-guard and four sailors were embarked from pratique on board the infected vessel, to depurate it and land the cargo. One of the sailors was attacked on the 2nd of April and recovered; he had had the plague in Malta in 1813. Another sailor was attacked; he also recovered.

No mention is made of any of the official inmates of the lazaretto or attendants upon the sick having suffered.

1828.—On the 13th of June 1828, the Russian frigate "Castor," with 281 of a crew, arrived at Malta from Armiro, from which she had sailed on the 21st of May. She had previously left Malta in pratique on the 30th of April for Navarino and Modone. On the 3rd of May, she was in company with three other Russian ships-of-war; they had captured a Turkish corvette, which had sailed the day before from Modone for Alexandria, having on board 600 individuals, including the crew, invalids, sick, and wounded from Ibrahim Pacha's army. (It is not to be wondered at that some malignant fever prevailed amid such an assemblage). The captured corvette was manned by 15 sailors from the Castor, and men from the other Russian ships; at the same time, 200 out of the 600 of the corvette's company were taken on board the Castor, and, on the 11th of May, were all landed on the coast of Morea; the Castor receiving back the 15 of her crew from the corvette. On the 17th, she arrived at Armiro;

and on that day a sailor was seized with headache, vomiting, and delirium. Next day, another was taken ill with similar symptoms. On the 19th the former patient died, the body exhibiting externally nothing indicating plague. On the 20th, the latter was carried off; and still no marks of plague were visible on the body. On the same day, a third sailor was similarly attacked; he died on the 24th, but without having exhibited any of the outward signs of plague. On the 2nd of June, while at sea, a fourth sailor was taken ill; but, besides the general symptoms observed in the three preceding cases, this patient had a swelling under the right arm; he died on the 9th. As the surgeon now declared the disease to be a contagious pestilential fever, the frigate was immediately ordered to Malta, there to undergo quarantine and depuration. *No new cases occurred either on board or at the lazaret during the Castor's stay.*

1835.—A Russian brig, with a cargo of bales of cotton and linen and other susceptible goods, arrived from Alexandria on the 2nd May with a foul bill, bound for Leghorn, and having 13 persons (originally 15) on board. On the 11th of April, whilst at Alexandria, one of the sailors fell overboard; on the same day, he was taken ill with a pain in the chest. He, however, got better, and continued so until the day after leaving Alexandria (this was on the 18th), when he became worse, and on the following day he died: no marks of plague were observed on the body. On the 27th, whilst off Candia, another sailor was taken ill with pain in the chest, extreme debility and spitting of blood; he continued daily getting worse until the 28th, when he died. Several blue spots were observed on the body. On the 1st of May, being near Girgenti, a third sailor was seized with violent headache and general debility; these symptoms continued until the following day, when he died. On the same day (2nd), a fourth sickened in a similar manner to the others. The rest of the crew remained in health. During the stay in the lazaretto, five other cases occurred, and four of them proved fatal. In these four cases, there were petechiæ and carbuncles: in the fifth there were not any. *Again, there is no mention of any of the attendants in the lazaretto having been affected.*

1837.—An Ottoman vessel arrived on the 22nd February from Tripoli (which she had left on the 15th) with a foul bill of health, having a crew of 6 persons and 52 passengers on board. One of the latter had been taken ill on the day of leaving Tripoli, and continued so all the voyage: he had been kept apart in a small boat on deck. When taken to the lazaretto, two bubos were visible in the groins: the man recovered. *This is all that is stated respecting this vessel: the disease, therefore, did not spread to any one.*

1837.—An Ottoman vessel, “laden with susceptible goods and beans,” which had sailed from Tripoli with 11 of a crew and 22 passengers on the 10th of February, arrived at Malta on the 23rd. One of the passengers fell overboard during the passage, and was drowned. Two of the passengers and one of the crew sickened in the lazaretto—one on the 27th, another on the 28th, and the third on the 8th of March; they all died on the second day after the attack. In one case there was a bubo, in another there were petechiæ.

Another vessel arrived about the same time from Tripoli with a foul bill, and two persons sick. On being conveyed to the lazaretto, symptoms of

plague appeared in both. One died. “*Two of the crew, who attended and nursed their fellow-sailor in free communication with him, continued in perfect health.*”

1840.—H. M. steamer “Acheron” from Alexandria arrived at Malta 27th April 1840, with a foul bill of health in seven days, with eighteen passengers and forty-eight persons in crew, having brought the mails, several parcels, letters, and two horses, all well on board. On the 29th, early in morning, the health-guard, who was put on board on the day of her arrival, reported to the captain of the lazaretto that one of the crew, a boy, during the night, at about 9 P.M., died, and that one of the stewards was seriously ill. The corpse and the sick steward having been landed in the lazaretto and examined by the physician, evident symptoms of plague were observed upon them. “*The persons, who attended and nursed the deceased, continued well.*”

1841.—On the 9th of March, H.M. frigate “Castor” arrived in 15 days from Kaiffa, having had 13 cases (two were doubtful) of plague on board; of which 9 had proved fatal. Four of the men had been taken ill on shore at Kaiffa, before the frigate sailed. On the 23d of February, four other men were sent from shore to be put on the sick list. In one or two of the cases, the symptoms were those of gastric fever; but in others the fever was truly malignant, and was accompanied with glandular swellings in the groins and axillæ. In one case the cervical, and in the other the sub-maxillary, glands were affected; in the latter instance, the patient was to all appearance recovering from the original disease, but was carried off by the diseased state of the tongue and fauces, the viscid secretions therefrom having produced sudden suffocation. In one case, the symptoms resembled those of *delirium tremens*, and were treated as such.

It is unnecessary to enter into farther particulars: suffice it to say that there is not a vestige of proof that the disease was communicated, in a single instance, from the sick either to the healthy on board or to any one in the lazaretto.

1841.—An Ottoman brig, in ballast, arrived from Alexandria on the 26th of May, having 15 persons in crew, and 180 passengers (haggis). She had sailed from Alexandria on the 8th. One of the passengers had died during the voyage; and three others had sickened, when in sight of the island. While in the lazaretto, 13 cases of plague took place, and 10 of them proved fatal. Of these, one occurred in a Maltese boatman, who was put in quarantine, from pratique, with one of the patients on the 28th. No other particular is mentioned.

A month afterwards, an Austrian brig, in ballast, arrived from Alexandria, which she had left with a foul bill of health, and having a crew of nine persons, and 105 passengers: she was bound for Tangiers. Eight of the passengers died on the voyage. While in the lazaretto, other three cases took place. Two of these proved fatal; the third, which occurred in a health-guard who had put in quarantine with the sick, did well.

The last instance of imported plague in the lazaretto of Malta was that of an Ottoman brig, which arrived in July of the same year, in 37 days from Alexandria, with a foul bill of health, 87 persons on board, and laden with linen, flax, beans, &c. No casualty occurred during the voyage. While in quarantine, four deaths took place; one from dysentery, one

from inflammation of the brain, one from enteritis, and one from (what is called) pestilential bubo.

Now these various facts, drawn from the experience of the quarantine authorities at Malta during the last 25 years, appear to us to afford convincing testimony as to the very little risk of the transmissibility of the plague, away from an epidemic focus of the disease. Here we have an account—unexceptionably authentic, be it remembered—of between 40 and 50 cases of recognised plague having occurred in the lazaretto of Malta, without the disease having been communicated in a single instance to any of the *employés* in that establishment. The only cases which occurred among those in pratique were four; and what, pray, were the circumstances in which these persons were attacked? Two were of a party which had been put on board an infected vessel, to clean her out; and the remaining two were men who, from pratique, were put in quarantine and confined along with the sick—most probably in a small room or chamber.

The critical reader will have remarked how promptly and easily the disease was arrested, and how small the number and mortality of cases were on board the two ships of war, compared with the merchant vessels, crowded as these latter often were with poor filthy passengers, who had come direct from a focus of infection. Most of these vessels moreover, it will be observed, had foul bills of health upon their arrival.

So much for the results of infected vessels which have arrived at Malta within the last 25 years. Let us now see what has occurred at Marseilles during the same period. Our information upon this point is derived from the French Report, which has been already analysed at so great length; but we have deemed it better to introduce the details here, for more convenient comparison with those just given.

1819.—A Swedish vessel arrived at Marseilles on the 1st of May from Susa, which she had left on the 15th of April, and from Tunis, which she left on the 20th: both places were at these dates afflicted with epidemic plague. She had a crew of 12 persons; and, besides them, 17 passengers had been received on board at Tunis. On the 25th, one of the sailors was attacked with plague; he died. On the 26th, another of the sailors fell sick; but he recovered after a very tedious convalescence. Besides these deaths on board, a woman and her infant died: the latter of dentition, the former of what was supposed to be milk-fever. The rest of the crew and passengers remained healthy.

On the 12th of May, one of the health-guards, who had been put on board the vessel, was taken ill: he died on the 16th.

Not a word is said of any other person, either in the vessel or in the lazaretto, suffering.

1825.—A vessel, laden with cotton, hides, and wool, arrived on the 30th June from Alexandria, which she had left on the 29th of May. On the 5th of June, one man was taken ill and died on the 9th with symptoms of plague. A boy fell sick on the 16th, and died on the 19th, on which day the captain also was attacked: he died on the sixth day afterwards. Another man was taken ill within a few hours of the arrival of the brig at Marseilles; he was without delay conveyed to the infirmary of the lazaretto. The constitutional symptoms were by no means severe;

two bubos had formed in the left groin, but neither of them suppurated. This man recovered. There was another case, in which the symptoms were comparatively very mild.

No mention is made of any of the attendants in the lazaretto being infected.

1837.—The “Leonidas,” a post-office steamer, having on board 47 of crew and 18 passengers, arrived at Marseilles on the 9th of July, having left Constantinople on the 27th of June, Smyrna on the 30th, and Syra on the 1st of July. Passengers in quarantine had been embarked and disembarked both at Syra and at Leghorn; and at Malta, too, several passengers had been taken on board, but all in quarantine. Upon her arrival at Marseilles, one of the stokers was affected with low fever; he died next day. On examining the body on the 11th, it is stated that the brain and intestines were found to exhibit marks of violent inflammation; but that there was no appearance of bubos, carbuncles, or pètechiaë. On the same day, another man, who was in the habit of sleeping in the same bed with the last patient, was visited by the lazaretto physician. He had been suffering for two days with severe headache, and within the last 24 hours, a painful swelling had made its appearance on the upper part of the left thigh. The case was regarded as very suspicious. The tumour became considerably larger, and the patient was in a state of great prostration with occasional delirium. On the 15th, petechiæ were observed on various parts of the body. On the 16th, a carbuncle appeared over the left ankle; the bubo had shrunk considerably; diarrhœa, vomiting, and delirium were the chief constitutional symptoms. The patient died next day. No *post-mortem* examination was made.

On the 20th, the cook of the “Leonidas” was taken suddenly ill in the lazaretto, with intense headache, vomiting, and great prostration. Besides these symptoms, there was a painful swelling at the lower part of the right groin. Next morning he was bled from the arm. On the 22nd, the headache was very severe, there was frequent vomiting of a greenish matter, the tongue was foul, and the patient was wandering in his ideas, and occasionally delirious. On the 23rd, the symptoms were more unfavourable; profuse diarrhœa had set in; the patient was in a state of collapse. Death took place on the 24th. When examined on the following day, the body was spotted with blueish patches in different places; the tumour in the groin had sunk down very much.

No mention is made of any of the lazaretto attendants having suffered; not even Dr. Chevillon, who had most heroically waited upon the two last patients with the greatest assiduity.

We need surely make no comments on the facts which have now been adduced;—facts too, be it remembered, drawn from the official records of lazarettos, the very places where we may be sure that the most would have been made of every event, which seemed to favour in any measure the doctrine of infection, and the consequent necessity of strict Quarantines.

And now what are the conclusions to be drawn from the mass of evidence that has been brought forward in the preceding pages? Are we going beyond the limits of fair deduction when we assert that henceforth the doctrine of the *contagiousness* of the Plague—by which term we mean its transmissibility from one person to another by mere contact—must be

utterly thrown overboard? And yet, be it remembered, it is upon this very delusion that almost the entire system of existing Quarantine Regulations has been founded. Had the disease been regarded as only one form of highly malignant fever, capable of infecting the atmosphere and thereby, under circumstances of neglected ventilation and cleanliness, of diffusing itself from the sick to those in their immediate neighbourhood, how much vexatious suffering might have been avoided! We cannot indeed recall the past; but let us act more wisely for the future. The now-admitted overwhelming evidence that the Plague has never, in one authenticated instance, been introduced by merchandize coming from infected countries must, in itself, be sufficient to open the eyes even of the most prejudiced to the enormous abuses of the present system.

But it is not to the pestilence of Egypt alone that the facts and reasonings, which have been engaging our attention, are applicable. If it has been proved that the diffusion of the Plague is always attributable rather to atmospheric influences than to any direct transmission from one individual to another, how much more may this be asserted of Epidemic Cholera and the Yellow Fever! That any reasonable person should ascribe the extension of the former of these diseases to the operation of personal infection, or seek to arrest its progress by military cordons and so forth, is indeed surprising. As a matter of course, we are not going to discuss the question at present. Suffice it to say, that Lord Ellenborough did nothing more than give expression to the general sentiments of the medical profession when he recently declared, in his place in the House of Lords, that Cholera in the East Indies is not an infectious disease.

With respect to the Yellow Fever, it may be fairly asserted that, although unquestionably apt occasionally to exhibit infectious qualities on board ships, and wherever the most perfect ventilation and cleanliness are not attended to, there would be no greater danger in admitting into a pure and airy hospital patients affected with it, than with the bad forms of common Typhus—which is done every day both in this country and in France.

In conclusion, we beg to express our earnest hope that, as the present Government has pledged itself to the working out of several much-needed social reforms, the general question of Quarantine may be one which shall meet with its prompt and scrutinizing investigation.

NOTES.

Note—page 22, line 2.

The very important question—*Can the plague arise spontaneously on board a ship that has had no communication with an infected place, or with any persons or goods that can be reasonably believed to be contaminated?*—has been started of late years, and is one that deserves much more attention than has hitherto been paid to it. As a matter of course, the ultra-contagionists will at once deny that such an occurrence is possible; but mere assertion will neither prove nor disprove the point proposed.

Several cases have been reported by Drs. Botzaris, Brayer, and Laidlaw which seem to prove that plague may arise under the circumstances alluded to.

One of the most remarkable instances on record of a *pestoid* fever, accompanied with all the characteristic symptoms of genuine Plague, being induced by the operation of local causes at a distance from an endemic locality, is that related in the 2nd Vol. of the *Medico-Chirurgical Review*, for January 1825.

Four sailors of a vessel in Whampoa roads went on shore to inter the corpse of one of their messmates, who had died of dysentery. Two of the men began digging a grave; unfortunately they lighted upon a spot, where a human body had been buried only three months before. The instant the spade went through the lid of the coffin, such a horrible effluvium issued forth that the two men fell down nearly lifeless. When taken on board, symptoms of fever speedily set in. On the fourth day from the commencement of the attack, numerous petechiæ appeared over the breast and arms; and, in one of the patients, a large bubo formed in the right groin, and another in the axilla of the same side, which speedily ran on to suppuration. Both men died; one on the evening of the 4th, and the other on the morning of the 5th day. On dissection, the inguinal and axillary glands were found enlarged and suppurating.

Note—page 24, line 36.

Lord Ponsonby, writing to Lord Palmerston in January 1839, says: "It is to be particularly observed that nobody pretends to be able to distinguish, with any tolerable certainty, the Plague from other fevers. I have known many instances of mistakes made by the most eminent of the medical men."

Dr. Robertson, in his official report of the British troops in Syria, uses these words:—

"Fever of a typhoid type and dysentery are very prevalent among the Turkish troops at Beyrout; this fever, in many instances, much resembles Plague, being attended with petechiæ and enlargement of the maxillary and parotid glands. I am very doubtful how far there exists a specific difference betwixt this form of fever and plague; it is difficult to distinguish between them in certain stages."

Dr. R., subsequently, again alludes to the fact that the typhoid fevers of Syria often much resemble Plague, being attended with petechiæ and enlargement of the parotid gland.

Note—page 38, line 3.

The description of Dr. Whyte's case is thus given by Mr. Rice, who was doing duty at the time in the plague hospital at El Hammed:

"Dr. Whyte came here last night, January 2nd, 1802: soon after he came in, he rubbed some matter from the bubo of a woman on the inside of his thighs. The next morning he inoculated himself in the wrists with matter taken from the running bubo of a sepo."

In subsequent letters, Mr. Rice states that "Dr. Whyte continued in good health on the 5th, and all day on the 6th till the evening, when he was attacked

with rigors and other febrile symptoms.” He continued to have shiverings, succeeded by heat and perspiration, much affection of the head, tremor of the limbs, a dry black tongue, great thirst, a full, hard, and irregular pulse, great debility and great anxiety. “He still persisted that the disease was not the plague, and would not allow his groin or armpits to be examined.” He became delirious on the 8th, and died next afternoon.

Now, taking this narrative as a correct one,—and we have derived it from the article in the *Quarterly Review*, that was written by the late Dr. Gooch, in 1826, for the express purpose of proving that the Plague was a virulently *contagious* disease—is there not just ground for hesitation, before we positively assert that Dr. Whyte died of the Plague at all?; for the very characteristic features of the disease were certainly not present in his case.

Note—page 63, line 39.

Whether we adopt, or not, the opinion, far too dogmatically asserted by certain writers, that the Plague at Malta in 1813 was introduced by the vessel “St. Nicholas” from Alexandria, on board of which it unquestionably existed, there cannot, we think, be a reasonable doubt but that the disease subsequently spread by *infection*, i. e. by contamination of the atmosphere with morbid effluvia, and not by mere *contact* with the sick. Dr. Gooch, notwithstanding his ultra-contagionist prejudices, is obliged to admit that it cannot be *proved* that any communication ever took place between the St. Nicholas and the family on shore, in which the disease first broke out. Moreover, he omits to state that none of the fresh crew, that were put on board the vessel to navigate her back to Alexandria, were taken ill;—a very remarkable circumstance certainly, if she had imported the disease into Malta.

Dr. Hennen also (a decided contagionist) candidly acknowledges that, how the plague was introduced into Malta in 1813, is a question still involved in doubt—“nothing amounting to positive certainty being known.” He mentions expressly that, for several months before the outbreak of the pestilence, a sickly state or “epidemic constitution” of the atmosphere existed in the island.

Note—page 41, line 34.

The alarm of some of the ultra-contagionist physicians in Egypt, during the prevalence of epidemic Plague, may be judged of from what we read of poor Dr. Lardoni, one of the physicians of the Pacha:

“His harness was wholly of unsusceptible materials, his saddle was closely covered with oil-cloth, his stirrups were braided and his reins made with filaments of the date tree; he had a huge oil-skin cloak in the shape of a sac, which rose above his head and descended beneath his feet; he was always escorted by four servants, one before, one behind, and one at each side, so that no person could approach him.”

In spite of all these ridiculous precautions, the enemy found its way to him. He died of the plague; while many of his brethren, who took no precautions whatsoever, escaped, and are living to this day.

Had space permitted, we should have transcribed here the regulations in force in the present day, at Marseilles, for the treatment of cases of real or suspected plague. The patient is to be kept in a room by himself, separated by an iron barrier from the attendants. They are to be dressed in oil-silk, and have no direct communication with him; medicine and food being pushed on a tray as near to him as possible. If a bubo is to be opened, he is to be instructed how to do it himself! The medical men in their visits are always to keep 12 yards at least distant from him: unless, indeed, some student or assistant volunteer his services, and then he must be locked up in a room adjoining that of the patient.

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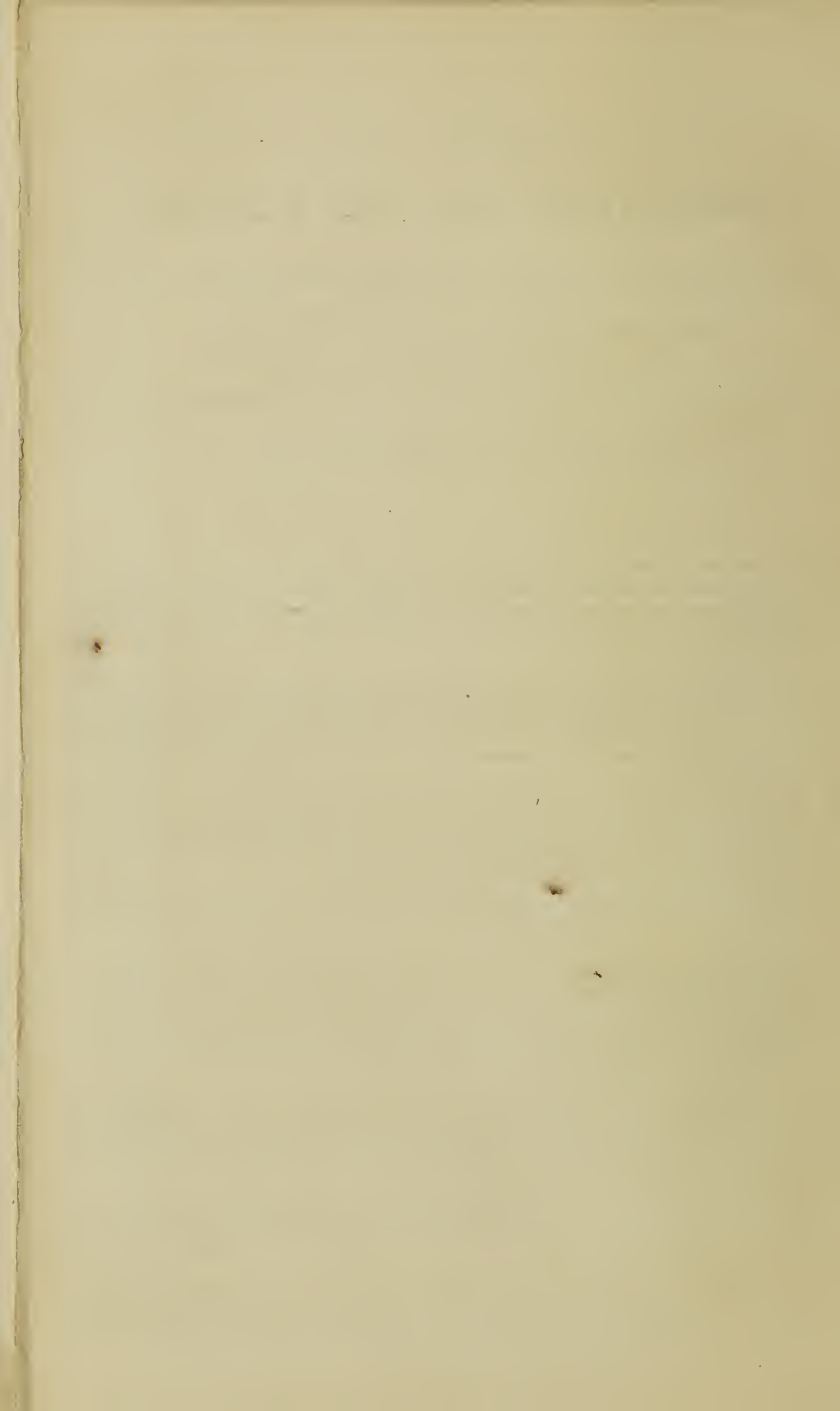
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